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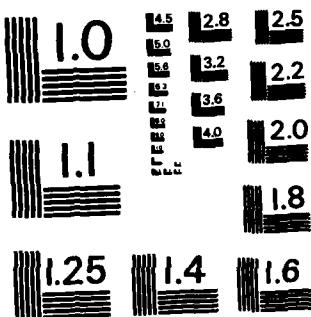
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AN ARCHAEOLOGICAL SURVEY  
OF CERTAIN LANDS ADJACENT TO THE  
GALISTEO DAM, NEW MEXICO

Richard W. Lang

Submitted  
to the  
U.S. Army Corps of Engineers,  
Albuquerque District  
... by  
John D. Beal  
Contract Program Administrator  
School of American Research  
Santa Fe, New Mexico

March 12, 1976

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## 1. INTRODUCTION

Through a letter dated December 10, 1975, the School of American Research was formally requested by Jasper H. Coombes, Chief, Engineering Division, the Albuquerque District, Corps of Engineers, to furnish a cost estimate for an archaeological survey of 430.38 acres of land adjacent to the Galisteo Dam and Reservoir, New Mexico. This land, held by the Corps of Engineers, Department of the Army, had been adjudged "not required for project operation and . . . excess to our needs" (Coombes, pers. com.) and was therefore being considered for sale. As noted by Coombes, "Prior to sale of the land, this District must prepare an environmental assessment on the impact of disposal and must have an archeological survey of the area completed."

In letters dated December 17, 1975, and January 7, 1976, John D. Beal, Director, School of American Research Contract Archaeology Program, supplied the Corps of Engineers with cost estimates for an inventory of archaeological manifestations within the 430.38-acre area and the development of recommendations for mitigation. On January 21, 1976, a contract (DACW47-76-M-0277) for such work was signed between the School of American Research and the Corps of Engineers (see Appendix A). Field survey was carried out January 27 through 29 and February 3, 1976, with John D. Beal, Christopher S. Causey, Jane Kepp,

and Richard W. Lang participating. Survey efforts on January 27 were directed by Beal, with survey and analysis thereafter directed by Lang to the conclusion of the project.

The survey methods employed were basically those conventional to intensive site-inventory surveys conducted by the Contract Archaeology Program of the School of American Research. The 430.38-acre area was traversed in a series of parallel, linear transects, 150 to 200 feet wide depending on the number of field workers participating, with each member of the survey party being responsible for covering a surface area 50 feet wide and of variable length as dictated by the study area boundaries. Upon discovery of an archaeological site, all members of the party took part in examining it and in determining its primary locus and outlying manifestations potentially associated with it; and while one crew member was selected to map the site configuration and establish precise site location within the survey area, each of the others recorded his or her individual observations. Upon completion of site recording, crew members realigned themselves in their positions at the time of site recognition, and transect coverage was resumed.

Data recorded for each site fell within the following categories:

1. size and form of site area as indicated by general artifact density and composition
2. the basic nature of cultural manifestations, i.e., architectural (if present), ceramic (if present), and lithic

3. artifactual details of potential or known significance to determinations of site function and chronological placement
4. geographic and topographic location and its relationship to nearby features of local topography
5. site area and adjacent vegetative cover
6. slope and exposure of site
7. site condition and requirements for mitigation, i.e., recovery strategy and projected time/labor demands

Each such site was designated within a consecutively numbered sequence prefaced by the letters GR- (for Galisteo Reservoir), numbered from 1 to 19.

Not all localities at which artifacts were observed were assigned formal "site status" or allocated the degree of recording attention described previously. These arbitrary "nonsites" consisted of archaeological locations at which not more than three artifacts were observed within a reasonably confined area under concentrated surface coverage. At the majority of these locales only one artifact was found. In all instances, these artifacts were of the chipped-stone class and normally of a formo-physical variety difficult to place chronologically.

The exclusion of these localities from the site inventory, in contrast to the inclusion in the numbered site series of areas exhibiting a cluster of sherds representing a single ceramic vessel (as is the case with sites GR-1 and GR-15), may, on its surface, appear theoretically contradictory. However,

this dichotomy of method reflects a practical judgment of informative potential and relative significance to chronological and other kinds of reconstruction that had to be weighed in terms of primary project goals, responsibilities, and limitations. Had recording standards applied to designated sites been implemented in the case of isolated artifacts, field time would have been increased by approximately 40 man-hours, to no appreciable profit.

Isolated finds were not completely dismissed, however, and notes were taken on both rough location and general artifact properties. It is our belief that the method under which these artifacts were recorded was the most rewarding in all terms, allowing completion of the survey within the time allocated and simultaneously providing the greater degree of data input potential in such manifestations. As will be discussed subsequently, the distribution of these isolates was ultimately recognized as culturally patterned and exhibiting a different level of significance from that offered by the numbered sites, but possessing its own quality of importance within the context of overall archaeological interpretation.

## 2. THE SURVEY AREA:

### LOCATION AND NATURAL ENVIRONMENT

#### LOCATION

The 430.38-acre survey area is located within the Galisteo Creek drainage and the Mesita de Juana Lopez Grant and fronts the west side of the Galisteo Dam. The area lies completely within Sections 5 and 8, Township 14 North, Range 7 East, as indicated on the Madrid Quadrangle (15 Minute Series) of the U.S. Geological Survey. Within Section 5, all but the north-eastern corner of the NW 1/4, the extreme northwest corner of the SW 1/4, and the NE 1/4 saw extensive coverage; in Section 8, the NW 1/4 was fully traversed to a point not less than 750 feet east of the eastern boundary of the Santo Domingo Pueblo reserve, and complete transection of the northern one-third of the NE 1/4 was carried out. As a detailed large-format topographic map was not available during the survey of January 27-29, actual limits of the area to be studied were difficult to define prior to January 30, when a quality map was provided by the Corps of Engineers. In consequence, transects of January 27-29 extended beyond the limits of the contracted survey area at several points. These extensions, as well as the limits of the defined survey area, are shown on Map 1.

#### GEOLOGY AND TOPOGRAPHY

As I have pointed out in a prior publication (Lang 1971:69), "No prehistoric community [or set of archaeological sites] can

be well understood without reference to its relationships with the natural environment." In keeping with that view, extensive notes on the survey area's environmental attributes were compiled during the field period, and limited library research was devoted to this category of information.

The topography of the survey area is the result of an extremely complex sequence and combination of geologic, climatic, and hydrologic events primarily assignable to the past 180 million years, and through natural as well as man-caused processes the alteration of the area's physiographic details actively continues into the present.

The survey area lies at the eastern edge of a major tectonic feature known as the Santo Domingo Basin (Kelley 1952), a member of the Basin and Range Physiographic Province formed by regional post-Triassic crustal movements of uplift and constriction. The greater extent of the basin lies to the northwest and forms an element of the Rio Grande trough. Galisteo Creek flows northwest from the survey area along the northern margin of the basin, which in the immediate survey locale is bounded on the south and southeast by the Mesita de Juana Lopez and the foothills of the Ortiz Mountains, and on the north by a precipitous escarpment of uplifted Jurassic formations fronting the Santa Fe piedmont slope. From the heights of this escarpment, elevation drops rapidly over a short horizontal distance, some 280 feet to the bed of Galisteo Creek in the SE 1/4 of Section 5.

This rock wall and the prominence surmounting it are formed of sandstones and shales of the Morrison Formation. Rising to an elevation of over 5,760 feet, this feature provides the greatest topographic relief found in the survey area and is balanced by a high mesa remnant of the same formation on the south side of Galisteo Creek in Section 8. Together, these opposed eminences and uplands to the southeast form a terrain constriction through which the creek passes from the Galisteo Platform and into the Santo Domingo Basin (Disbrow and Stoll 1957:32).

In the area along the south side of Galisteo Creek, elevations are generally between 5,560 and 5,440 feet. Lower lying portions of this sector are represented by the bed and floodplain, of Galisteo Creek certain immediately contiguous alluvial terraces, and outwash deposits at the mouth of a large unnamed arroyo that meets the creek in the SW 1/4 of Section 5. The terrace areas below the 5,480-foot contour are generally within the maximum flooding pool of Galisteo Creek. These are dominated by fine sand and silt deposits, while the primary floodplain and channels exhibit vast areas of cobble/gravel cover interfingered with finer alluvium. Overall, such terrain accounts for about one-third of the total survey area; like the areas on the creek's north side, which have been extensively disturbed by construction and maintenance of both the dam and the now-abandoned Atchison Topeka Railroad line, it was completely devoid of archaeological manifestations.

Upland surfaces on the creek's south side slope away to the north and west from exposed remnants of the Entrada sandstone/Todilto limestone at the survey area's eastern boundary, and to the north and east from the eroded mass of the Chinle Formation. Along the margins of the large arroyo previously noted, the red-brown sandstone and sandy-shale of this last-named Triassic formation provide a dramatic color contrast to the more subdued buff tones that generally characterize the landscape. While most of the area is mantled by soils, it is primarily underlain by rock strata of the Chinle (Disbrow and Stoll 1957: Plate 1).

Soil classes observed mirror both the geologic variety of the immediate area and the greater complexity of geologic history within the Galisteo drainage. Along the bluffs that overlook Galisteo Creek and the arroyo entering the survey area in the NW 1/4 of Section 8 are found extensive deposits of gravels and cobbles primarily composed of intermediate volcanic rocks originating in the Cerrillos Hills and Ortiz Mountains. This bedload material is prominent over most of the high terrace rim of the 5,520-foot contour and in channel and floodplain areas of the major streams. At higher elevations, to at least 5,600 feet, it is common along the sides of small feeder arroyos and less conspicuous on gently sloped terrain where the soil mantle is deeper. Occasional pebbles and cobbles of this unit represent a fine-grained, dark-gray basaltic rock subject to concoidal fracture, which was much used by prehistoric peoples of the

survey area for the production of lithic tools. Other materials so used, and found as pebbles, cobbles, and subrounded tabular fragments on the high gravel terraces, are red to pinkish-gray, gray, and mottled blue-gray cherts, and silicified wood.

All of these lithic resources appear to be of relatively distant geographic source, deposited locally by stream action and, presumably, during peneplain formation. While other sources are possible, the volcanic formations of the Cerrillos area constitute the most likely place of origin in the case of the basaltic rock. A good candidate for the source of the cherts and petrified wood is the Cretaceous(?) - Oligocene Galisteo Formation, which is noted for its fossil driftwood beds and the presence of filled channels, which contain, along with other coarse clastics, chert and "chalcedony" fragments of well-rounded to sub-angular form (Disbrow and Stoll 1957:10-11). Most of the siliceous raw material found at local sites is probably attributable to Galisteo Formation deposits south and east of Cerrillos; however, some of that found only in a worked state may have been obtained outside the survey area and could associate with strata other than that of the Galisteo Formation. Both "jasper" and red chert fragments are reported for the more local Morrison Formation, and while red chert and jasper pebbles of small size were noted during coverage of Morrison outcrops, this material does not seem to be represented at the archaeological sites. The only unquestionably "alien" lithic material found at sites

located during the survey is obsidian, probably from as far distant as the Jemez Mountains.

The salient topographic features of most of the survey area are the broad, flat, 5,480-foot-level terraces and the higher, gradually sloped terrace land that rises above them to the south. These upland terraces have been deeply dissected by several feeder arroyos and their shorter tributaries, which have carved out a nearly continuous series of northeastward-jutting and rounded headlands that command the valley floor. Comparatively long drainage lines and correspondingly entrenched headlands characterize the bluffs of the Galisteo southeast of the large arroyo, while generally shorter drainages and relatively blunt headlands are characteristic of the area to the northwest. All of these projecting terrace remnants are underlain by near-surface bedrock, outcrops of which tip them in several places, forming classic "rock-defended terraces" along a valley front where much of the upper, older alluvium has been removed through north-south meandering of the Galisteo's channel. It is significant in evaluating site distribution to recognize that the relatively longer drainages located from the center of Section 5 southeastward have been responsible for a broadening of the floodplain and lowest terrace areas along a corresponding section of Galisteo Creek. While in the southwestern corner of Section 5's NW1/4 the 5,480-foot terrace is of roughly equal extent in comparison with that to the

southeast, the short bluff-draining arroyos of this area have made a less substantial contribution to floodplain extent, and the very low sandy terraces of the southeastern area are generally lacking here.

Survey area soils are of two basic origins: (1) primary stream deposition of suspended clay/silt loads and bedload sands, and (2) local rock formation weathering. A particularly local soil quality has been most especially effected along portions of the large arroyo's margin by erosion of the Chinle Formation with deposition of red-brown sandy soil over broad areas, and by weathering of light-colored sandstones in the eastern one-half of the NW 1/4, Section 8, which has resulted in the formation of now-stabilized dunes. Such soils as these are also exposed to some depth along smaller feeder arroyos of the area. The high terraces are covered with soils of mixed origin and composition, while the broad, 5,480-foot-level terraces on the Galisteo's south side are formed mainly of deep silty-clay deposits, tending toward very uniform composition. The alluvial composition of the floodplain has been previously noted.

From an archaeological perspective, the most important topographic features of the area as a whole are:

1. the large arroyo oriented northeast-southwest and Galisteo Creek
2. the broad, low terraces and outwash fan along the south side of the Galisteo floodplain in the eastern half of the survey area
3. the bluffs of the high terrace
4. the bluff gravels containing basalt, chert, and silicified wood

CLIMATE AND WATER RESOURCES

The Galisteo Dam area is located within the driest portion of Santa Fe County, New Mexico, falling within a zone that extends south along the Rio Grande Valley from the lower Santa Cruz River on the north, which receives an average of 10 inches or less precipitation annually (Tuan et al. 1973:18). The low annual precipitation of this portion of the Rio Grande trough and environs is largely due to a montane rain-shadow effect, whereby mountain masses to the east and west shelter the area from moist winds. Records for adjacent areas suggest highest precipitation levels during the June-through-August summer season, with the December-February months marking the driest period of the year (Tuan et al. 1973:29-34). The deceptive quality of these means must, however, be recognized, and intervals of annual precipitation both well above and well below the present averages can confidently be projected for the past as well as the future. In terms of real available moisture, the potential for plant and animal use of the limited precipitation the area presently receives is further reduced by the evaporative effects of wind, temperature, relative humidity, and solar radiation on soils of variable texture and associated depths of water table. In addition, vegetative cover and resulting effects of ground-surface shading and plant transpiration play an important role.

Only the most general kinds of statements on relative

moisture retention and loss over the land surfaces and soil units of the survey area can be made at present. In early February, the floodplain areas and feeder arroyo floors of the survey area exhibited the highest moisture content and shallowest depth of moisture-laden levels. The high uplands ranked next, followed by the soil of the 5,480-foot terrace. These are, of course, generalizations, and while accurate as such should not be allowed to mask the fact of internal variation due to localized attributes of soil composition and exposure. On the whole, the southeastern portion of the survey area, which is basically north exposed and to some degree relatively more sheltered from prevailing southwestern winds, exhibits grossly higher soil-moisture values.

The major hydrologic feature of the study area is, of course, Galisteo Creek, which is little affected by local climatic conditions, depending primarily upon snowmelt and orographic rainfall in the Sangre de Cristo Mountain and Glorieta Mesa regions. Uniform flow is, therefore, greatest during the late winter-early spring period of high-elevation melt. Since the Galisteo Creek drainage is long and extensive, the depletion rate of water yield during drought is much slower than would be the case along the shorter drainage lines of tributary arroyos. However, under circumstances of prolonged drought, depletion of basin stores could progress to the point at which recharging under wetter climatic conditions would take longer

than recharging a smaller basin. It is also noteworthy that while the Galisteo drains a relatively large land area, it heads within the lower mountain elevations and would be subject to more rapid drought depletion than, say, the Santa Fe or Tesuque rivers, which drain the higher elevations of the Sangre de Cristos.

In addition to being semiarid, local climate can be characterized as cool, although true extremes of temperature are rare. Extrapolating from neighboring weather station data, January/June daytime temperatures appear to average in the thirties and seventies, respectively. A frost-free season of about 160 days is suggested but may be expected to vary substantially from year to year over long periods of time and to be subject to local airflow and wind pattern effects (Tuan et al. 1973:80, 87).

#### VEGETATION AND FAUNA

Although the survey area encompasses a relatively small unit of acreage, the presence of a major stream and the pedological and topographic variation which that presence has largely fostered has resulted in a considerable range of vegetation. While this variability can be categorized through gross vegetational units, the precise development and makeup of any given unit may also vary internally. In some cases, divisions between units are extremely clear-cut, while in others one or more units will grade into one another almost imperceptibly. Collectively, the area can be assigned to the lower Upper Sonoran

Life Zone, but in meaningful systemic terms such classification really says very little.

During the survey, general notes on site vegetation and vegetation of surrounding terrain were consistently kept, and on February 3 the identification of discovered sites on the recently acquired Corps of Engineers topographic map was combined with mapping of basic vegetation unit distribution. The resulting phytogeographic map (Map 2) is imperfect in terms of absolute distributions; e.g., the distribution of dense salt cedar (Tamarix pentandra) growth may be very slightly wider, narrower, and so forth, than the map indicates. However, the distributions are basically correct and furnish detail more than adequate to our purposes.

The following floristic units were recognized and recorded and are colorkeyed on Map 2.

#### Juniper-Grassland

The faciation covered under this designation is distributed over most of the acreage above 5,500 feet altitude, extending in some areas down to 5,460 feet on certain slopes. Although this unit is continuous over most of its range, it contains islands of grassland, as indicated on Map 2. The primary index species of the unit, the oneseed juniper (Juniperus monosperma), exhibits greatest density on the bluffs and highlands south of Galisteo Creek and east of the large arroyo. Junipers are more thinly distributed over the uplands northwest of that arroyo,

and very sparse over the talus slope, rock outcropings, and benches of the high escarpment on the creek's north side. The major causal factors of these contrasts of density seem to be directional exposure and localized wind patterns, but the full range of determinants is undoubtedly more complex.

A variety of short grasses, numbering blue grama (Bouteloua gracilis) among the more common, are also prominent in the juniper-grassland faciation, as are snakeweed (Gutierrezia lucida) and Spanish bayonet yucca (Yucca glauca). Rabbitbrush (Chrysothamnus nauseosus cf. bigelovii) exhibits sparse distribution along terrace ridge lines. Colonies of dagger cholla (Opuntia clavata) are common everywhere. A scattering of cane cholla (Opuntia cf. imbricata) also occurs; two species of pricklypear (Opuntia spp.) were noted, and the hedgehog-pincushion cacti of the Mammillaria type are present. While both pricklypear and Mammillaria cacti are uncommon in the survey area, they exhibit slight increase as one progresses downslope to the north from the 5,580-foot contour on the upland terraces of the area's southeastern sector.

Along the southwest-facing, gravel-rimmed terrace margin of the 5,560-foot contour, adjacent to the first terrace of the large arroyo, compositae (Aster arenosus?) are relatively common in areas of sparse grass. On the slope below, ricegrass (Oryzopsis hymenoides) squirrel-tail (Sitanion hystrix) and thistle (Cirsium sp.) were observed.

Not given separate map status from the juniper-grassland within which it occurs, but possessing a distinctive composition, is a flora restricted as a group to the steep-sided and narrow arroyos draining the southeastern uplands. On northwest-facing slopes of these arroyos, Apache-plume (Fallugia paradoxa) is common, in association with dense juniper growth and thick colonies of yucca and snakeweed. On the arroyo floors, flowering annuals are abundant and pricklypear is more prominent than is the case elsewhere.

#### Juniper-Pinyon-Oak

Of very limited occurrence in the survey area is a floristic unit including pinyon pine (Pinus edulis) and the even less common wavyleaf oak (Quercus undulata) along with oneseed juniper. This unit occurs on north and northwest exposures of the sandstone escarpment in the SE 1/4 of Section 5, extending some distance up the canyon that borders it on the north. On the east side of this canyon, squawbush (Rhus trilobata) was also observed. Associated intrasurvey area elevations range from 5,600 to about 5,700 feet.

#### Grassland

Considerable variation has been subsumed under the grassland designation. The unifying aspect of this unit is the presence of extensive grass cover and an absence of dense, tall-growing brush and of significant numbers of trees. The grassland

facies can best be discussed in the context of specific survey area localities:

1. On the sandy terrace and upper floodplain below and southwest of the Kaiser Gypsum plant, grasses are dominant, with associates generally limited to scattered snakeweed and little rabbitbrush (C. n. cf. bigelovii).
2. On the sandy, dune-like terraces below the Morrison escarpment, big rabbitbrush (C. n. cf. graveolens) is found in addition to the plants noted under number 1, and a single cottonwood (Populus wislizeni) is present at the terrace base.
3. On the high 5,540-foot bluff on the creek's north side and at the extreme eastern end of the survey area, mixed grass and snakeweed is dominant, with scattered little rabbitbrush and flowering annuals.
4. On the broad 5,480-foot terrace from the location of site GR-17 to a point almost opposite and north of site GR-16, grasses are present almost to the exclusion of other flora, with scattered snakeweed being the only significant associate. However, at the extreme southeastern margin of this grassland area, where it meets the large arroyo, cane and dagger cholla occur on the eroded terrace edge. Northwest of site GR-16, and below 5,480 feet, grassland associates show a marked change, with snakeweed less in evidence and cane cholla occurring abundantly. Intergradation with dense saltbush (Atriplex canescens) occurs here.

5. On the 5,500-foot headlands overlooking the 5,480-foot terrace, inclusive of the GR-16 area, islands of open grassland are found within the juniper-grassland belt. Although snakeweed and dagger cholla are present on these exposed highlands, Spanish bayonet yucca is the primary associate.

6. In the GR-9 locality, where soils are primarily derived from the Chinle sandstone and high bluffs and outcrops of that formation form a bowl-like area, relatively tall but sparse unidentified grass is found along with scattered yucca and little rabbitbrush. In the grassland directly to the north and on the same side of the large arroyo, snakeweed is prominent.

7. The grassland of the extreme southwestern corner of the survey area on the 5,540-foot terrace adjacent to the large arroyo shows well-developed grass cover grading into mixed grass, snakeweed, and little rabbitbrush at its narrow north end.

8. The large expanse of grassland on the highlands above and to the east exhibits mixed grasses and snakeweed with scattered little rabbitbrush and cane and dagger cholla. On the headland where site GR-4 is located, this complex, minus dagger cholla, is joined by yucca and a few junipers. In the area of site GR-15, on the 5,480-foot terrace, a like composition, but without yucca, was noted.

9. Grasslands of the 5,560- to 5,540-foot terrace from the vicinity of site GR-8 to a point about 500 feet southwest

of site GR-6 exhibit wide variation. Directly below site GR-8, little rabbitbrush is prominent, snakeweed, dagger cholla, and devilsclaw (Proboscidea sp.) occur, and ricegrass is found on the terrace face. Westward to about 250 feet beyond site GR-12, cane cholla is prominent, rabbitbrush absent, and snakeweed and fourwing saltbush present. West around the terrace headland occupied by sites GR-11 and GR-19 and into the locality of site GR-10, snakeweed with yucca, dagger and can cholla, and saltbush is prominent, grading into mixed grass, snakeweed, and little rabbitbrush over the terrace expanse of the GR-6 area. Here, along the bluff-fronting eastern portion of the terrace, grass with scattered cane cholla predominates.

Saltbush

Dense fourwing saltbush growth was noted in three locations: (1) on the 5,460-foot terrace directly to the southeast of the Kaiser Gypsum facility; (2) along the 5,440-foot terrace to the south on the opposite, i.e., south, bank of Galisteo Creek southeastward to a relatively broad and shallow arroyo where erosion of the terrace is marked; and (3) at the western tip of the terrace on which site GR-13 is located. In the first of these locations the only significant associate is grass; in the second, saltbush is mixed with scattered snakeweed, yucca, cane cholla, and colonies of wolf-berry (Lycium pallidum) in the area of the small arroyo, and coyote gourd (Cucurbita sp.) is present on the terrace where it meets the south channel of

the Galisteo. In the last of these three locations, snakeweed and both types of rabbitbrush are to some extent intermixed with the saltbush, and some dense, but areally limited, saltbush is present at the base of the terrace in short erosion cuts. An area of fairly open saltbush intermixed with grass, big rabbitbrush, and snakeweed occurs on the alluvial fan of the large arroyo to the northwest of site GR-10.

Cane Cholla

Dense cane cholla growth was present in only one area, on the 5,460- to 5,480-foot terraces in the vicinity of Corps of Engineers boundary markers 31 and 32. The area is completely southwest-exposed, being sheltered on the northwest, north, and northeast-to-southeast by cliffs and bluff areas. Snakeweed was the only common associate here.

Big Rabbitbrush

Big rabbitbrush dominates the desert wash vegetation of the large arroyo outside its main channels, which are largely devoid of cover. Little rabbitbrush is intermixed with it, and snakeweed is common. Scattered grass cover occurs, junipers are occasionally present, and cane cholla is found on some of the higher gravel remnants. Rabbitbrush cover is relatively dense over much of the arroyo floodplain to its mouth and southeast to the mouth of the arroyo east of site GR-11, where rabbitbrush and saltbush are both well represented.

Within the arroyo south of the dam access road and just outside the survey area, rabbitbrush cover is more open, and Apache-plume, salt cedar, and Navaho tea (Thelesperma sp.) are present.

Mixed rabbitbrush, snakeweed, and grasses occur on the low terrace below site GR-13 and beyond the limits of dense saltbush growth in the area of boundary marker 24.

Vegetation of the Creek Floodplain

In part, the Galisteo Creek floodplain is occupied by big rabbitbrush and saltbush units, but the area covered by this unit designation differs from these in its distributional particulars. Over most of its extent, the floodplain exhibits only scattered little and big rabbitbrush and even less saltbush. Scattered snakeweed occurs, and grass cover is sparse. Dense salt cedar is found in certain stream edge and terrace base locations, and more open Tamarix growth occurs in plain depressions and on the margins of gravel ridges. The single cottonwood found in the survey area was located at the extreme northern edge of the floodplain. True riparian growth is uncommon and poorly developed, and the area shows close similarity to vegetation of the desert wash type.

Present-day cover of the survey area offers only limited food potential. Plants having edible parts, the portions potentially used, and the seasons of availability to human populations are indicated in Table 1.

Table 1  
Edible Plants of the Survey Area

Plant	Portions	Seasons
Oneseed juniper ( <u>Juniperus mono-</u> <u>sperma</u> )	Berries	Primarily autumn through spring
Pinyon pine ( <u>Pinus edulis</u> )	Nuts	Autumn
Wavyleaf oak ( <u>Quercus undulata</u> )	Acorns	Autumn through winter
Cane cholla ( <u>Opuntia</u> cf. <u>imbricata</u> )	Joints, buds, fruits	Primarily spring through autumn
Pricklypear ( <u>Opuntia</u> spp.)	Pads, flowers, fruits	Year-round
<u>Mammillaria</u> cacti	Stem, body, flowers	Year-round
Spanish bayonet yucca ( <u>Yucca</u> <u>glauca</u> )	Flower stalks, buds, flowers, and fruits	Spring through early summer
Ricegrass ( <u>Oryzopsis</u> <u>hymenoides</u> )	Seeds	Summer into early autumn
Coyote gourd ( <u>Cucurbita</u> sp.)	Fruits, seeds	Summer primarily
Navaho tea ( <u>Thelesperma</u> sp.)	Flowers, leaves (for tea)	Summer

Local Fauna

The vertebrates recorded during the survey may, for the most part, be considered characteristic of those diurnally active and present during the late winter season in which the survey

was conducted. Certain species recorded are present year-round, others only seasonally.

Among the birds, robins (Turdus migratorius) and mountain bluebirds (Sialia currucoides) were abundant, occurring in large flocks, and were noted (as with all of the birds other than the mockingbird, Mimus polyglottos, house finch, Carpodacus mexicanus, and the juncos, Junco spp.) on all four days of the field survey. Red-shafted flickers (Colaptes cafer) common ravens (Corvus corax) and brown towhees (Pipilo fuscus) were observed regularly as individuals or in small groups, and a single mockingbird was recorded on the first field day. On the last field day, flocks of house finches and juncos (mainly the gray-headed Junco caniceps, with a few Oregon juncos, J. oreganus) were present, directly preceding a winter storm that struck the next day; these birds had probably moved down from higher elevations in anticipation of that event.

Native mammals present, as indicated through sightings or other evidence, consisted of mice, kangaroo rats (Dipodomys sp.), woodrats (Neotoma sp.), cottontail rabbit (Sylvilagus cf. audubonii), black-tailed jackrabbit (Lepus californicus), coyote (Canis latrans), and mule deer (Odocoileus hemionus).

Although mouse burrows, tracks, and other signs of presence were observed (particularly in the grassland near the Kaiser Gypsum plant), no individuals were seen and specific identification is impossible. Individual kangaroo rat denning areas were noted in only two locations, one near site GR-1 and the

in late December or in January, when populations tend to move to lower elevations.

These included extensive test excavations in the roomblock mounds of San Marcos (Nelson n.d.; 1916:179; Reed 1954:323-24). Somewhat later in the first half of the twentieth century, H. P. Mera (1940:25-26, 30) of the Laboratory of Anthropology made pottery collections in the area, but it was not until 1940 that renewed major work was conducted. Once again this was at San Marcos, where Erik K. Reed (Reed 1954:323-43) directed the excavation of twelve rooms of Block XXXVIII, the earliest known portion of the San Marcos complex.

No substantial projects were again fielded in the western area of the Galisteo Basin until 1964, when Stanley D. Bussey and Bertha P. Dutton undertook an archaeological survey of the area to be affected by the Galisteo Dam for the Laboratory of Anthropology, Museum of New Mexico, and the U.S. National Park Service. Several sites were located during this survey, four of which were chosen for excavation under the direction of Robert K. Alexander, Laurens C. Hammack, and Kenneth Honea. These sites, which will be discussed in their chronological contexts below, produced valuable information on the Archaic, Pueblo III and IV, and Spanish Colonial occupations of the area (Kayser and Ewing 1971).

Since the time of the Galisteo Dam project, archaeological studies in the basin's western reaches have concentrated in the prehistoric/early historic Cerrillos Hills mining area. Surveys oriented toward the location of Pueblo turquoise and lead mines and related sites were made by Bruce M. Moore, Southern Illinois

University, and A. H. Warren, Laboratory of Anthropology, in 1970 and 1971, and later Paul S. Grigg conducted excavations at one mine site for the Albuquerque Archaeological Society.

#### CULTURAL SEQUENCE

##### Archaic Occupation

No evidence suggestive of pre-Archaic occupation of the Galisteo Basin has yet come to light, and the closest reported Paleo-Indian site is a manifestation of the Cody Complex located near Bernalillo, New Mexico, about 22 airline miles southwest of the survey area (Judge 1973:63-64). The earliest documented cultural material from the basin comes from La Bolsa Site (LA 356) (Honea 1969, 1971).

While there is an implication in the writings of Honea (1971) that "lithic sites" other than La Bolsa were noted during the Bussey-Dutton survey, these were apparently not of a nature that would warrant site designation. La Bolsa is located slightly less than 2.5 miles upstream from the survey area, on a sandstone bluff overlooking Galisteo Creek from the south. The site extended over an area of approximately 650 to 75 meters and exhibited a number of hearths of both shallow and deeper pit form about which were scattered burned cobbles and other occupational debris.

Developmentally and culturally, La Bolsa may be assigned to the early Archaic and falls within a long period of cultural adjustment by an ever-increasing reliance upon a diffuse hunting-gathering subsistence economy. The kinds of features and tools

found at La Bolsa suggest as a unit that the site functioned as a staging base for a variety of animal-plant exploitative efforts and as a locus for tool- and food-processing activities.

The preserved tool inventory of La Bolsa can be largely classed as representing a cobble tool industry. Direct percussion was the common technique of chipped-stone tool production, and evidence for pressure flaking is reported as rare. Items produced on flakes are relatively uncommon and appear to consist exclusively of projectile points and a variety of scraper types. The dominant cobble tools are represented by a multitude of forms, which Honea classified as choppers, scrapers, knives, gouges, picks, and gravers, or combinations thereof. Most abundant within this last group was a class of artifact that Honea termed a "chopper-grinder," having functions implicit in that label. Characteristic of La Bolsa's chipped-stone assemblage is a proclivity toward the use of locally available dark-colored basalt, quartzite, and argillite. Possible trade connections are represented by less commonly occurring obsidian from the Jemez Mountains west of the Rio Grande and a single specimen of Texas Alibates dolomite. Of particular interest and importance is the fact that La Bolsa's tool kit included one-hand cobble manos, unshaped boulder and slab metates, and small grinding slabs. The manos and metates, at least, provide some suggestion of the processing of seeds and, perhaps, other materials into meal.

Important to the following classificatory and chronological discussion of La Bolsa is the form of projectile points found there. Those made from local materials occurred as two forms:

(1) relatively long, weakly shouldered, and stemmed, with an indented base; and (2) triangular with a slightly convex lateral and basal outline. The raw material in all cases is basalt. Two points of obsidian were found, one a rather nondescript fragment and the other representing a stemmed point (this specimen is unfortunately not illustrated). In addition, La Bolsa produced a Cody Complex Scottsbluff point made from a chert of proposed nonlocal origin.

Honea believed the Scottsbluff specimen to be contemporary with the more common elements of La Bolsa assemblage, although not a product of the culture responsible for La Bolsa Site or most of the artifacts found there. In addition, Honea associated the weakly shouldered, indented-base projectile with a similar form without indented base, having found both forms together at the Quemado Site (LA 8066) in Catron County, west-central New Mexico (Honea 1969:58, 61). Both forms were viewed as basically contemporaneous and as products of the same culture complex and were grouped under the designation "Rio Grande Point." In modification of Renaud's (1946) "Upper Rio Grande Culture" concept, Honea assigned La Bolsa and Quemado sites to a Proto-Archaic Quemado Phase, Rio Grande Complex (Honea 1969:57, 61, 67-68).

In dating this Quemado Phase, Honea looked to the date associations of other western manifestations containing: (1) weakly shouldered, stemmed points like those from La Bolsa and Quemado; and (2) Scottsbluff points. Chronological data derived from Honea's survey of such associations led him ultimately

to suggest dating of the Quemado Phase to "around 7000 to 6000 years ago," and to propose derivation of his Rio Grande Point from the northern Plains Agate Basin-Hell Gap continuum through a diffusion of certain basic elements of that tradition "onto the southern Plains and thence into the Southwest" (Honea 1969:65).

More recent work on the Archaic problem carried out by Cynthia Irwin-Williams (1973) in the Arroyo Cuervo area of the Rio Puerco (east) and Jemez River drainages, some 40 miles west of the survey area, has shed important light on both the chronological position of La Bolsa and previously unrecognized temporal and cultural variation within Honea's Quemado Phase. Irwin-Williams (1973:4-7, Figures 2, 3, 7) finds evidence, first, for placing assemblages containing Rio Grande points later in time than the Cody Complex, and second, for taxonomically and chronologically separating the unindented-base and indented-base forms of the "Rio Grande Point," as well as their associated tool complexes.

The unindented-base point form, like that found at the Quemado Site but not at La Bolsa, Irwin-Williams assigns to an early Archaic Jay Complex and Phase, Oshara Tradition, dating between about 5500 and 4800 B.C. She sees the indented-base point of both La Bolsa and Quemado occurrence, and its associated culture, as derivative from a Jay Complex base.

The developmental horizon for which salient traits are La Bolsa-style point, large chopping tools, and hearths like those of La Bolsa. Irwin-Williams terms the Bajada Phase of the Oshara Tradition. The suggested time interval for this phase is about 4800 to 3200 B.C.

Within the Bajada Phase, chronologically associated tool-kit alterations suggest a basis for recognizing an early and a late division. During the earlier half of Bajada Phase times, long, weakly shouldered, stemmed points and lanceolate bifacial knives are prevalent, while Irwin-Williams's Figure 7 suggests that cobble choppers are relatively rare or absent. With the later years of the Bajada Phase, shorter, more prominently shouldered points appear, as previously characteristic point forms decline; the lanceolate knives are absent, and large chopping tools are common. In addition, certain tools more common to the following San Jose Phase (about 3200 to 1800 B.C.) are then present. From at least the middle years of the Bajada Phase onward, hearth types like those from La Bolsa are present.

Using these criteria, La Bolsa's complex does not fit neatly into the Arroyo Cuervo sequence. Its projectile points are of the early form, while hearth types and the abundance of cobble choppers suggest lateness. Comparison is further complicated by the presence of a formative milling assemblage at La Bolsa, while manos and metates are absent at sites of the Arroyo Cuervo Bajada Phase, although present in the succeeding San Jose Phase (Irwin-Williams 1973:8, Figure 7). Precise parallels need not, of course, be expected. However, comparison of La Bolsa-Arroyo Cuervo data seems to suggest relatively long, periodic occupation of La Bolsa beginning by about 4000 B.C. and potentially extending into San Jose times. Although we have only Honea's description to judge by, the straight-sided expanding-stemmed point of obsidian may find parallels in formally

similar points of the Arroyo Cuervo region's San Jose Phase, and certainly does not seem relatable to any element of the Bajada Phase. Whether the manos and metates of La Bolsa are also representative of this hypothetical later Archaic component or belong to some local expression of the Bajada Phase constitutes a question of great importance, but one that cannot readily be answered through La Bolsa data alone.

Primary occupation of La Bolsa during Bajada Phase times is suggested by artifactual composition and Schoenwetter's (1971) interpretation of La Bolsa pollen samples from Archaic hearths as representing a "drier environment . . . not too distinctive from the present environment of the Galisteo Basin area," but one in which grassland rather than juniper-grassland characterized the vegetation of the area. In the Arroyo Cuervo region, the Bajada Phase is likewise associated with a "period of considerably decreased moisture," while the following San Jose Phase is suggested to correspond with a generalized "shift toward greatly increased effective moisture." The intensity of later Archaic activity, possibly falling within the San Jose span, cannot be accurately determined but suggests the possibility of the presence of Archaic microbands locally up to perhaps about 2500 B.C. For the present, however, precise dating of post-Bajada Archaic manifestations and even the cultural-developmental assignment of them is a matter of gross speculation.

Puebloan Occupation

While data from elsewhere in the northern Rio Grande region document the slow progression from the hunting-gathering pattern, through early experiments with agriculture, into the semisedentary existence of early Pueblo times, such continuity of record is presently lacking in the western Galisteo Basin and in the drainage as a whole. To what extent this approximately 4,000-year span of discontinuity may accurately mirror the realities of culture history, as opposed to being a simple gap in archaeological knowledge, is now difficult to say. The greater portion of the span is associated with later Archaic developments, and no particular effort toward the isolation of these, if present, has been made and published upon either in the Galisteo Basin or in adjacent areas. The picture for the period from about A.D. 600 to A.D. 900 is only slightly clearer (Mera 1935) but does suggest a very real scarcity and impermanence of population from the approximate location of San Felipe Pueblo northward in the Rio Grande drainage of New Mexico during this interval.

Population increase in the north is clearly indicated for the tenth century A.D., when groups sharing cultural affiliations with peoples of the Rio San Jose and Rio Grande south and west of the Galisteo Basin expanded northward. During the period from about A.D. 900 to A.D. 1000, the first substantial pithouse villages, with or without associated surface structures of jacal or adobe, appear in the region between the Galisteo Basin and the vicinity of Taos, New Mexico. Diagnostic of this interval is plain and neck-banded culinary pottery and painted ceramics of

the Red Mesa Black-on-white type. Over the next 200 or so years, continued population growth is suggested, and with it a growing social and religious complexity. Some relatively large pueblos are known for this time, and a combination of internal and external factors led to other kinds of material changes as well, including the appearance of new ceramic expression such as Kwahe'e Black-on-white and indented corrugated pottery.

Most sites of the interval from A.D. 900 to A.D. 1200 or 1250 lay north and southwest of the Galisteo Basin. Mera's (1935) mapped distribution of "Chaco 2 B/W" (presumably Red Mesa Black-on-white) and Kwahe'e Black-on-white in the Rio Grande suggests the occurrence of sites productive of one or the other type in the basin from the west almost to the location of the survey area, and again at the extreme eastern end of the Galisteo Creek drainage. A search for site records that might support the western aspect of this distribution, however, was unproductive, and there is in fact no record of Pueblo communities predating the last half of the thirteenth century in the western Galisteo Basin.

The earliest documented Pueblo sites belong to a period that saw major changes occur on a number of levels. The most striking of these changes are the shifts toward larger population aggregates centered in one- or two-storied pueblos, and from mineral to carbon painted pottery, i.e., Santa Fe Black-on-white. It is the former trait that led Wendorf and Reed (1955:143) to call the interval between about A.D. 1200 and A.D. 1325 the Coalition Period, and that qualifies these sites for placement in the

Pueblo III Period under the Pecos classification (Kidder 1927).

As demonstrated in the Galisteo Basin and elsewhere, however, small farming settlements were not completely replaced by larger villages and towns, at least during the early phases of this period.

Taken as a whole, the basin settlements of the late thirteenth century exhibit considerable diversity of plan and architecture. In the eastern reaches of the drainage, both the above-ground C-shaped block type, with associated, smaller house-mound isolates (LA 9144), and complexes formed of non-contiguous linear roomblocks (LA 8) are known, in addition to at least one extensive pitroom village (LA 3333) (Stewart L. Peckham, pers. com.). Overall, the density of so-called Pindi Phase (Wetherington 1968:90) or Santa Fe Phase (Hammack 1971) sites appears to be greater in the eastern half of the basin than in the area between Cerrillos and Santo Domingo. In the latter area, only two settlements of this date are known, LA 590 and LA 9147, and both are quite small.<sup>1</sup>

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<sup>1</sup>A third site possibly associated with the late thirteenth century and classed as Pueblo III may be located in the western area. This is LA 9145, recorded as a U-shaped complex with possible associated kiva. The three blocks forming the U are estimated to be composed of about forty rooms. Unfortunately, I was not able to establish the location of LA 9145 on the basis of field notes available in the files of the Laboratory of Anthropology.

Site LA 590, located opposite Cerrillos on the south side of Galisteo Creek where the creek is joined by a tributary arroyo, is described in field records housed by the Laboratory of Anthropology as two small rectangular surface structures separated by a distance of about 15 meters, the mounds measuring about 1.8 by 3.6 and 2.1 by 6.9 meters respectively. Associated pottery noted was Santa Fe and Galisteo (?) black-on-white and indented corrugated.

Site LA 9147 (Hammack 1971) is located just under 4 miles downstream from LA 590, and about the same distance east of the survey area. Like LA 590, LA 9147, the Waldo Site, is positioned on the south side of the stream overlooking the floodplain. The main feature of the Waldo Site was a linear arrangement of four masonry-walled rooms, with an adobe-walled (and perhaps jacal) room extension on its northwest side, the whole being oriented with its long axis northeast-southwest and measuring 1.0 to 2.0 meters wide and 6.3 meters long. The evidence suggests that this structure was single-storied throughout. All but one room exhibited wet-laid adobe floors, one showing a combination of adobe and flagstone flooring, and only two rooms exhibited interior wall plaster, one being a room with formal hearth. Formal hearths were present in two cases, different in style from each other. That within the southwestern-most masonry room had been built against the center of the south wall, was partially slab-lined, and was surrounded on three sides by a raised adobe collar. The second formal hearth occurred in

the center of the floor of the adobe-walled room addition, was of circular outline, and possessed a fully encircling adobe rim. Evidence for informal hearths was found in all rooms but one (including those with formal hearths). In two instances fires had been built on room floors near the centers of the rooms, and in three against the north walls of rooms.

In general, the architectural features of the Waldo room-block are typical of those found at contemporaneous, or nearly contemporaneous, sites of the Cochiti and Santa Fe areas to the north, such as the North Bank Site (LA 6462) (Bussey 1968), Pindi Pueblo (LA 1) (Stubbs and Stallings 1953), and Arroyo Hondo Pueblo (LA 12) (Schwartz 1972), although each of these sites exhibits levels of departure from a shared standard. In the case of the Waldo Site, such departure is represented by the unusual practice of using a stone slab as a base for temporary hearths built against north walls.

In addition to the surface structure, LA 9147 contained two features identified as pithouses. One of these is represented by a rather irregular pit of ovoid outline measuring 2.0 meters deep and somewhat less than 1.3 meters in maximum horizontal dimension. If this feature does, in fact, represent some ultimate intention of pithouse construction, it was never completed. Its walls and floor evidenced no attempt at finishing, and no elements suggesting a roof were encountered in the pit fill. The only interior feature found was a floor-level ash accumulation, indicating a temporary hearth.

The second pithouse feature was 1.65 meters deep and about

1.50 meters in diameter. Two superimposed adobe floors were present, the later of the two exhibiting a shallow, ovoid hearth and the earlier having a more elaborate ovoid, adobe-collared hearth. A ventilator opening and tunnel were located in the eastern portion of the pithouse wall, and a small circular niche was positioned just above the floor level in the west wall. The walls themselves were reinforced with sandstone slabs over one-half of their linear distance and with vertical poles over the remaining half, the whole being plastered with mud.

As Hammack notes: "In this time period in the Rio Grande Valley, kivas are difficult to distinguish from pit houses since very little has been recovered that can be called 'ceremonial.'" Although Hammack ultimately opts for labeling the Waldo pit features as "dwellings" due to a belief that no "profitable comparison between these structures and Rio Grande kivas" can be made and on the assumption that an exclusive use of in-block society houses may have typified the early Pueblo situation in the Galisteo Basin, I find reason to disagree with certain points of that argument. Certainly the question "When is a pithouse a kiva?" is a perplexing one, applicable to many sites of the twelfth- and thirteenth-century Rio Grande cultures, but comparison of the finished Waldo pit structure, i.e., "Pit House 2," with similar features of earlier through later date is not unprofitable or purely academic.

Table 2 illustrates the distribution of pit-structure architectural features at both Kwahe'e and Santa Fe component sites of the area between the western Galisteo Basin and the

TABLE 2  
COMPARISON OF LOCAL PUEBLO II-EARLY PUEBLO III PITHOUSE/KIVA ATTRIBUTES

	Traits									
Site/Component	Red Snake Hill/ Kwahe'e Com.	North Bank/ Kwahe'e Com.	Tesuque By-Pass/ Kwahe'e Com.	TOTALS	Waldo/Sante Fe Com.	North Bank/ Santa Fe Com. a. Pitrooms	b. Kivas	Tesuque By-Pass/ Santa Fe Com.	Pindi/Santa Fe Com.	TOTALS
Cruciform Outline	1	1	1	3	1	1	4	1	2	3
Non-cruciform Outline	1	1	1	3	1	1	1	1	1	3
Diameter less than 2.0 m.	1	1	1	3	1	1	1	1	1	3
Diameter more than 2.0 m.	1	1	1	3	1	1	1	1	1	3
Walls unreinforced	1	1	1	3	1	1	1	1	1	3
Walls reinforced with pole	1	1	1	3	1	1	1	1	1	3
Walls reinforced with stone	1	1	1	3	1	1	1	1	1	3
Support posts (root)	1	1	1	3	1	1	1	1	1	3
Ventilator East	1	1	1	3	1	1	1	1	1	3
Ventilator West	1	1	1	3	1	1	1	1	1	3
Bench	1	1	1	3	1	1	1	1	1	3
Wall Niche	1	1	1	3	1	1	1	1	1	3
Attached Storage	1	1	1	3	1	1	1	1	1	3
Chamber	1	1	1	3	1	1	1	1	1	3
Circular/Ovoid	1	1	1	3	1	1	1	1	1	3
Collared HeARTH	1	1	1	3	1	1	1	1	1	3
Rectangular or Other	1	1	1	3	1	1	1	1	1	3
HeARTH	1	1	1	3	1	1	1	1	1	3
Ash Pit/Platform	1	1	1	3	1	1	1	1	1	3
Slipperu	1	1	1	3	1	1	1	1	1	3
Floor Cist	1	1	1	3	1	1	1	1	1	3
Pot Rest	1	1	1	3	1	1	1	1	1	3
Floor Slabs	1	1	1	3	1	1	1	1	1	3
Loom Holes	1	1	1	3	1	1	1	1	1	3
Misc. Post Holes	1	1	1	3	1	1	1	1	1	3

Sample Size: Red Snake Hill/Kwahe'e Component: 2 pithouses  
 North Bank/Kwahe'e Component: 7 pithouses  
 North Bank/Sante Fe Component: 1 pitroom, 4 kivas  
 Tesuque By-Pass/Kwahe'e Component: 1 kiva  
 Total Number of Structures: 19

Tesuque By-Pass/Sante Fe Component: 1 kiva

Waldo/Sante Fe Component: 1 pithouse  
 Pindi/Sante Fe Component: 2 kivas

Rio Tesuque. To some degree the data contained in Table 2 underscore the recognition that Rio Grande pithouses and kivas share a basic set of formal traits, and it is of particular interest that at least one feature normally classed as ceremonial, i.e., the sipapu, actually occurs more frequently in Kwahe'e component pithouses than it does in Santa Fe component pit structures identified as kivas. The wall niche, another such feature, is more common in Santa Fe component pit structures, but it should be noted that in addition to being found in "kivas" of typical form, it is also reported for a pitroom of the North Bank Site (LA 6462) (Bussey 1968:59) near Cochiti. Interior features are, then, not a consistent indicator of pithouse versus kiva status, and a basic traditional debt of Santa Fe component kivas to earlier Kwahe'e component pithouses/kivas for much of their formal makeup is obvious. Perhaps the best rule of thumb in the designation of kivas is the context of a pit structure within the total architectural complex of a given site. This is an old archaeological formula that generally assumes kiva functions for a pit structure associated with a surface houseblock when the latter contains rooms having clear domiciliary functions, as is the case at Waldo.

The only trait of the Waldo pit structure that represents a major departure from the norms of Santa Fe component kivas at other sites is its very small size, which is likewise smaller than the diameters of pithouses present in the Table 2 sample. I would suggest that the small diameter of the Waldo kiva may relate to one or both of the following considerations:

1. The loose gravels into which the feature was excavated may have demanded a smaller than normal diameter for structural reasons.

2. The small size of this feature may be commensurate with the equally small size of the population occupying the Waldo Site.

Technologically, the people of the Waldo Site shared with their distant La Bolsa predecessors a "preference" for the use of dark-colored rock of local availability, which Hammack identifies as a black argillite. While obsidian and cherts were also present, no data on their specific relative abundance are provided. Although the chopper is present, it is of a type made on a flake, as opposed to the cobble blank common to La Bolsa. Most of the chipped stone tools from Waldo were identified as scraper or knife forms produced on flakes, often through simple use. Hammerstones exhibit a greater formal variety than found at La Bolsa. Metates are of the slab type common to Santa Fe component sites, and the single mano found was of the two-hand form. The most common pottery at Waldo was Santa Fe Black-on-white and smeared-indentated corrugated culinary of the Tesuque Corrugated type (Lang n.d.). Of interest is the fact that the Waldo Santa Fe Black-on-white was tempered with tuff, which suggests affiliations, either immediate or through the medium of trade, with populations on the Rio Grande or beyond to the west. Pottery found in small quantities at Waldo consisted of plain-surfaced culinary, Kwah-e Black-on-white, and Galisteo Black-on-white, the last two represented by single specimens.

The only other sites potentially dating to the time of the Waldo manifestation and the local prominence of Santa Fe Black-on-white reported for the western area are the mine sites of LA 5027, LA 5029, and LA 5033, the last productive of galena and lead, while LA 5027 and LA 5029 are turquoise-mining localities. A. H. Warren, who recorded these sites in 1971, notes the presence of Santa Fe Black-on-white at each.

Following the phase of Santa Fe Black-on-white prominence over much of the northern Rio Grande, sites of the Galisteo Basin and certain adjacent areas evidence the ascendancy of a related but distinct pottery type named Galisteo Black-on-white. Locally, this event truncates the Santa Fe continuum and ushers in what has been called the "Galisteo Phase" or stage of the Coalition Period (Wendorf and Reed 1955; Wetherington 1968), beginning during the first half of the fourteenth century. At present, indications are that the interval of Galisteo Black-on-white prominence extended at least into the mid fifteenth century in some localities.

The appearance and subregional dominance of this pottery type have been generally interpreted to reflect the immigration of populations having ultimate sources in the San Juan region into portions of the Rio Grande, on the basis of corresponding historical events and Galisteo's clear attribute relationships to McElmo and Mesa Verde Black-on-white of the San Juan. While some migration-effect hypotheses call for a large-scale movement of San Juan groups into the Galisteo Basin, others outline the

development of Galisteo Black-on-white as manifesting the impact of either small San Juan increments or larger, but merely geographically adjacent, San Juan-derived populations, on a resident demographic and cultural matrix (Ford, Schroeder, and Peckham 1972:29, 31-32). Wherever the reality of the situation may lie, sites known to exhibit the characters of the "Galisteo Phase" cluster in the eastern portion of the basin and are not reported for it west of Cerrillos. A possible exception may be the initial settlement at San Marcos Pueblo (LA 98) (and potentially, some of Warren's mine sites), as San Marcos has produced tree-ring dates in the 1350s (Robinson, Hannah, and Harrill 1972:56). In addition, Reed's (1954) excavations there produced considerable quantities of Galisteo Black-on-white pottery, although in most proveniences the early glaze-painted redware Aqua Fria Glaze-on-red type was substantially better represented than Galisteo. As Reed's samples came from the fill of abandoned early rooms, however, they shed little or no light on the nature of San Marcos's initial ceramic industry. For the present, then, it is impossible to associate the earliest occupation of San Marcos with the "Galisteo Phase" without great qualification.

In concrete terms, so little is known of intrabasin developments of the period circa A.D. 1300 to A.D. 1400 and somewhat later that materials relating to this interval will not be overly dwelt upon here. It is sufficient to note that several relatively large sites, and numerous smaller ones, located on the Galisteo and its tributaries east of Cerrillos either fall well within the

"Galisteo Phase" or at least were occupied by its terminal years. The latter would seem to be the case with the better-known sites of Las Madres and San Cristobal pueblos (Dutton 1964, 1966; Nelson 1916; Schaafsma n.d.). Sites appear to be made up exclusively of masonry or coursed-adobe roomblocks one or more stories high, with or without associated kivas. Throughout most, if not all, of its production span, Galisteo Black-on-white was extensively traded, and it may be assumed that at least some of the sites associated with this type in the basin were important production and export centers, supplying a market of considerable geographic extent and cultural variation.

Substantial population increase seems indicated for the western reaches of the Galisteo Basin during the late 1300s into the 1420s of the Pueblo IV, or "Classic," period (Kidder 1927; Wendorf and Reed 1955). Certainly Roomblock XXXVIII, and possibly other portions, of San Marcos Pueblo was occupied during this time (Reed 1954), and judging from their ceramic content the pueblos of Gipuy (LA 182) and Santo Domingo (LA 1281) were likewise inhabited (the Santo Domingo case being the most open to question) (Mera 1940:25-26, 30). The precise size of San Marcos during the early years of Rio Grande Glaze Ware introduction in the north is not known, and the ruins of Gipuy were unfortunately destroyed by erosion before the detailed character of that site could be recorded. Of a potential Santo Domingo occupation dating to this time, practically nothing is known beyond the fact that early glaze-painted pottery, i.e., Mera's "Glaze A," is present there. The status

of Santo Domingo prior the 1580s is, therefore, presently a matter of speculation. For Santo Domingo, Mera reports Glaze E and F types, in addition to Glaze A; and for Gipuy, A through E in his taxonomy. Types, both accepted and proposed, listed in the Laboratory of Anthropology files for Gipuy are Aqua Fria Glaze-on-red, Cieneguilla Glaze-on-yellow, San Clemente, Largo, Espinosa, Puaray, and San Lazaro glaze-polychromes, and the northern types Abiquiu and Bandelier black-on-gray.

In his discussion of the ceramics from the abandonment levels of Roomblock XXXVIII, San Marcos, Reed indicates an overwhelming proportion of Aqua Fria Glaze-on-red, followed in general quantitative order by Galisteo Black-on-white, Cieneguilla Glaze-on-yellow and glaze-polychrome (possibly inclusive of some thickened-lip "Largo" forms), Abiquiu Black-on-gray, Wiyo and Poge black-on-white, "Arenal" and San Clemente glaze-polychromes, and Chupadero Black-on-white. In a surface collection from the Roomblock XXXVII area, Aqua Fria was also prominent, but glaze-on-yellow sherds were most common, while Galisteo was represented by only seventeen sherds.

The best described of the early glaze sites of the western Galisteo Basin is the Wheeler Site (LA 6869), within the Galisteo Dam impoundment area (Alexander 1971a), about 1 mile east of the survey area. Wheeler was located on the 5,600-foot north terrace of Galisteo Creek, overlooking extensive floodplain and lower terrace deposits. The site was composed of three unconnected roomblocks formed of at least thirty-one rooms arranged around a plaza area containing a circular,

semisubterranean kiva. Dates of 1381r and 1386r from the kiva suggest major construction activity in the 1380s. Walls were built of coursed adobe with (in the case of the roomblocks) cobble footings, or of block, slab, and cobble masonry. As is the case at the contemporaneous Component II village of Arroyo Hondo (LA 12) near Santa Fe and the later western sector of the Alfred Herrera Site (LA 6455) near Cochiti (Lange 1968), storage rooms were north or west exposed, while rooms with hearths were located toward the south and east sides of blocks. Hearth forms are comparable to those of Arroyo Hondo, Component II, being rectangular and slab-lined, with or without adobe collars and stationary firedogs. Comparability diverges in the more common room-center placement of hearths at Wheeler, almost all of those of Arroyo Hondo's second component being built against walls. Another similarity between Wheeler, Arroyo Hondo, and Alfred Herrera is the presence of adobe-rimmed basins, which at Arroyo Hondo have been shown to have functioned as plant food processing areas. In further comparison with Arroyo Hondo, the only "unusual" features from Wheeler are the presence of deflectors in association with two hearths, one tricompartment hearth, and the occurrence of what appears to be an in-room double metate rest. A similar rest was found at Arroyo Hondo, but against the outside south-facing wall of a roomblock. Access to rooms appears to have been exclusively through roof hatchways, and in some cases, at least, rooms were ventilated through small wall openings.

Features of the Wheeler kiva are almost identical to those of the Component II "Big Kiva" of Arroyo Hondo, which also produced a cluster of 1386r tree-ring dates. The pattern of the hearth complex is basically the same, inclusive of the large pit east of the deflector, which at Arroyo Hondo was capped by a slab ladder seat. Likewise, loom holes are present in the floors of both kivas. The only major divergence is found in the relative size of the kivas (i.e., 4.75 meters at Wheeler, 7.50 meters at Arroyo Hondo), and certain specific details of wall and ventilator construction. Likewise, basic similarities exist between these kivas and that of the contemporary eastern sector kiva at Alfred Herrera (Lange 1968:77, 88, 90), although this last is oriented south.

The dominant painted ceramic from Wheeler is Aqua Fria Glaze-on-red, of which 1,054 sherds were present, followed by Cieneguilla Glaze-on-yellow with 634 sherds. While present, the Galisteo, Wiyo, and San Clemente types are rare. The dominant culinary pottery is Tesuque Corrugated, with smeared-indentated corrugated, unindentated corrugated, and plain surface texturing. Most of the Aqua Fria and Cieneguilla samples exhibited what appears from the descriptions to be classifiable as a "hornblende latite" temper, possibly of local origin. The second most common temper within the Aqua Fria group is crushed shard, apparently from various source areas, and a few augite latite-tempered specimens, tentatively assigned a San Marcos source, were present. A. H. Warren (in Alexander 1971a) suggests that a local clay source may have been present in the Mancos

shale.

The most common lithic artifacts were, as a class, the ground-stone type, consisting primarily of two-hand and one-hand manos, slab metates, floor polishers, and hammerstones. Within the chipped-stone group, flake scrapers and knives of basalt, chert, and slate were present. Choppers, of both flaked and unmodified rock, were relatively common and were made of argillite, basalt, and petrified wood. Within the flaked chopper category, the most common were cobble with incompletely bifacially flaked perimeters, followed by full-perimeter, unifacially flaked cobbles. The Wheeler choppers are similar to certain varieties from La Bolsa but do not exhibit the full range of variation found at that site.

Many of the rooms and the kiva of the Wheeler Site had been burned, and some room walls apparently had been intentionally leveled, which caused Alexander to suggest a forced depopulation of the site. The unlikelihood of voluntary burning of the site by its occupants is supported by the finding of an estimated 112 bushels of charred corn in the storage rooms. A similar event seems to be associated with the end of early glaze times at Pecos, i.e., late "Glaze II" or early "Glaze III" (Kidder 1958:62), and even clearer parallels may be drawn with the last years of the Arroyo Hondo occupation, when most of the pueblo was burned and with it large stores of corn. Although chronological limitations of the data make precise dating of these events somewhat speculative, the Arroyo Hondo

fire can be assigned to the early 1400s, and it appears likely that the Wheeler Site fire falls within roughly the same time period. At both sites, there seems to be evidence for depopulation on some scale before the fires, however, which may be attributed to the onset of drought after about A.D. 1415 in the Santa Fe area (Jeffrey S. Dean, pers. com.). The data from both Wheeler and Arroyo Hondo may suggest that adjustments of this phase of declining agricultural potential were accompanied by human competition and conflict in the Santa Fe and Galisteo Basin areas.

Other sites potentially contemporaneous with Wheeler in the western Galisteo Basin, beyond those previously noted, are site LA 9146, a pueblo producing Cieneguilla Glaze-on-yellow and black-on-white pottery, located on the south side of Galisteo Creek about 4 miles southeast of Wheeler, and the turquoise, malachite, and lead mines of sites LA 5027, LA 5028, LA 5030, LA 5031, and LA 5035.

Western Galisteo post-Wheeler manifestations of the prehistoric period are present at Gipuy and San Marcos, and at the mine sites of LA 5027, LA 5028, LA 5029, LA 5031, LA 5033, and LA 5034. Although N. C. Nelson's notes on his excavations in the later house mounds of San Marcos are available, correlation of excavated areas with specific intervals of time is generally impossible.

With the advent of the historic, both Spanish documents and archaeological data indicate occupations at San Marcos, Gipuy, and Santo Domingo pueblos. San Marcos has been identified with

the Malpartida of the Rodríguez-Chamuscado expedition of 1581-82 and Espijo's Santa Catalina of 1583 (Reed 1954; Schroeder and Matson 1965:139-40). Malpartida was described as a three-storied pueblo at this time. The Rodríguez-Chamuscado party also visited the pueblos of Talavan (Santo Domingo) and La Nueva Tlascala (Gipuy), noting that the latter was composed of "500 houses from one to seven stories high" (Schroeder and Matson 1965: 158). The name San Marcos was bestowed on that pueblo by Castaño de Sosa in 1591, and while journeying from San Marcos to Santo Domingo Castaño camped at what was by then the deserted pueblo of Gipuy (Schroeder and Matson 1965:157-58). According to Santo Domingo tradition, Gipuy had been destroyed by a devastating flood of the Galisteo, its households removing to Santo Domingo sometime in the middle to late 1580s.<sup>a</sup> Available historic documentation indicates that all three of these large pueblos were occupied by eastern Keres.

Both San Marcos and Santo Domingo participated in the Pueblo Revolt of 1680, which saw the temporary ejection of the Spanish from northern New Mexico, and were allied with the Cochiti, San Felipe, and northern Tiwa against the Tewa during the civil war that preceded the reconquest of 1692 (Schroeder and Matson 1965:144). At some point during this period of attenuated strife San Marcos was permanently abandoned. While the Spaniards sacked the pueblo of Santo Domingo on a punitive expedition in 1681, they did not burn it, and Santo Domingo was presumably reoccupied shortly afterward.

4. DESCRIPTION OF ARCHAEOLOGICAL SITES ENCOUNTERED

DURING THE SURVEY

As previously noted, nineteen designated sites were encountered and recorded during the School of American Research survey. These are described subsequently under their number designations. As most of them exhibited no cultural features beyond the smaller artifacts found on the site surfaces, site plans are provided in this report only for sites GR-3 and GR-12, both of which possessed definable masonry structures. While ground plans of all sites were made and are on file with the Contract Archaeology Program, School of American Research, their presentation here would not inform the reader beyond the level of the text descriptions. The distribution of these sites is illustrated in Map 1, and the approximate location of isolated artifacts is shown in Map 3. The scale of the U.S. Geological Survey map covering the area in question is so small and the map itself so destitute of detail, that the sites recorded could not be accurately placed on it, and any site coordinates derived through this map would possess too much error to be meaningful. Consequently, the locational coordinates traditional to descriptions like the following are not provided here.

SITE GR-1

This site is located within grassland of the 5,560-foot contour, within the relatively flat expanse of highland that

lies east of the large arroyo at the south end of the survey area. The site locus is about 66 meters southeast of the bluff margin overlooking the previously mentioned arroyo. The locality has open exposure in all directions.

The site area has a diameter of only about 3 meters, defined by sherds representing the only artifact noted, a broken polychrome olla. The specimen exhibited an outcurved rim with rounded lip and a predominantly red-slipped body and neck, with design zone formed of a yellow slip overlaid by basically triangular designs executed in a dark-gray paint. The paste of the specimen exhibited a red-gray core and brick-red wall margins. The temper was sand. Although the specimen was obviously from the so-called Puname Area, which includes the Keresan pueblos of Zia and Santa Ana on the Jemez River about 20 miles southwest of the survey area, I was not familiar with any variety of Puname Polychrome exhibiting the precise characters noted, and most particularly the exclusively geometric design found on this vessel. A. H. Warren kindly examined a sherd of the GR-1 vessel. She has noted like specimens assignable to Puname Polychrome at fieldhouse-like sites distributed between La Bajada and Placitas along the Albuquerque highway (I-25), which she speculates may have been pottery stands. Materials associated with such pottery at these sites suggest a mid-nineteenth-century date. There is some reason to believe that sand-tempered expressions of this Puname variety may have been produced at Santa Ana.

SITE GR-2

Site GR-2 is located in an area of eroded Chinle-derived soils within the belt of juniper-grassland edging the 5,550-foot terrace bordering the large arroyo on its east side. The site overlooks a small feeder arroyo of the former drainage line and is positioned about 82 meters east of the main channel of the larger arroyo. While the site is protected on the west by outcrops of Chinle sandstone and conglomeritic limestone, it is exposed in all other directions and possesses a particularly clear and distant view down the large arroyo to the north.

Artifacts consisting of chipped-stone tools and flakes produced on a variety of cherts were found scattered for a distance of about 15 meters along the head of the small arroyo noted above. No in situ features, or remnants of destroyed, eroded ones, were present. All of the tools observed appear to have had cutting and scraping functions. No chopping tools or cores were present. As with a number of other nonceramic sites found during the survey, it is presently impossible to place GR-2 chronologically, as both sites of the Archaic period and certain special activity areas datable to Puebloan times can or do lack ceramics. Sites of this class will receive some further discussion in a later section of this report.

SITE GR-3

This site is located some 33 meters southwest of site GR-2 and at the same general elevation. The cover of these two sites

is likewise similar. Site GR-3 occupies a point of land formed by the Chinle exposure, from which the terrace drops precipitously to a small area of floodplain about 6 meters below the site and on the east side of the large arroyo.

The main feature of site GR-3 is a one- to two-room rectangular structure measuring approximately 1.95 meters wide by 2.90 to 4.78 meters long (Figure 1), with its long axis oriented east-west. The footings, if not the walls, of this building were formed of sandstone slabs and limestone blocks collected from the Chinle outcrop, which backs the structure on its south. Masonry elements may have been set on edge as well as laid horizontally atop one another. The structure is badly eroded on its northeast and east sides, with slabs scattered for a short distance downslope to the north. Extending downslope from the masonry surface unit a distance of about 15 meters is a sheet trash deposit formed of sherds and chipped-stone artifacts. Predominant among the former were specimens of the Aqua Fria Glaze-on-red type, and only a few examples of San Clemente Glaze-polychrome and Cieneguilla Glaze-on-yellow were noted. No culinary pottery was observed. Lithic debris was composed of flakes and tools manufactured from local cherts and basalt.

Site GR-3 is protected on the south and east and fully exposed to the north and west. Its primary view is of arroyo terraces covering a large area west of the main arroyo.

The pottery from site GR-3 places it in early Pueblo IV times, perhaps within the last quarter of the fourteenth century.

having a primary operational base elsewhere. Among the efforts clearly associated with site GR-4 is the knapping of cherts obtainable from the local gravel deposits, and apparently immediately available at the site. If other activities were conducted here, they left no evidence that could be isolated from surface inspection alone.

SITE GR-5

Site GR-5 lies in juniper-grassland at an elevation of about 5,550 feet on a terrace point where two short arroyos cut downward toward the broad lower terrace on which site GR-6 is located. Site GR-5 is about 100 meters northeast of site GR-2 and approximately 202 meters southeast of site GR-6. It is fully exposed, with good views in all directions, but it cannot be observed from the adjacent lower terraces of the large arroyo or from the Galisteo Valley proper. The immediate site area, which measures about 4.5 meters north-south by 9.0 meters east-west, exhibits eroded red soils of the outcropping Chinle sandstone. Within the area defined were found flakes of translucent white, opaque gray-white, black, and pink to red chert. No artifacts of a culturally or chronologically diagnostic sort were observed beyond a shard of Aqua Fria Glaze-on-red, which would place some aspect of the site's use within the Pueblo IV cultural and temporal frame.

SITE GR-6

This site is located on the broad grassland-covered 5,500-

The character of the site suggests that it functioned as a farmstead, and its north exposure is additionally suggestive of primary warm-season occupation.

SITE GR-4

Site GR-4 is located on a high, 5,520-foot headland formed by the confluence of two northward-trending arroyos some 300 meters south of their mutual convergence on Galisteo Creek. The point of this headland commands a wide view of the Galisteo Valley north of the site, although the site locus, which lies within a saddle of the ridge, offers a more restricted view of immediate terrain and the bank and escarpment on the Galisteo's north side (GR-4 looks directly north toward GR-18). The site area cannot be seen from the valley bottom along the south side of Galisteo Creek. The site lies within an island of grassland surrounded by juniper woodland and is completely exposed in all directions.

As defined by scattered lithic debris, the site area measures approximately 40 meters north-south and 12 meters east-west, with its long axis following that of the ridge. No evidence of structures or hearths was observed. Flakes, cores, and core chunks of local gray to pink and red cherts formed the bulk of the artifacts, and unworked cobbles were also present. Only two formal tools, both flake knives, were observed. In addition to the chert artifacts, one basalt flake was recorded. Like site GR-2, site GR-4 is presently undatable, but it may be assumed to represent limited, special activities of some group

foot terrace adjacent to the large arroyo on its east side, about 600 meters southwest of the arroyo's confluence with Galisteo Creek. The site is north exposed and sheltered on the south by a great, domelike outcrop of Chinle sandstone. The site area extends for about 30 meters east-west along the base of this remnant and covers 3.6 to 7.5 meters of ground in a northeast-southwest direction. The western margin of the site area is only about 15 meters removed from the eastern terrace edge of the large arroyo. Excellent views are afforded across the terraces and floodplains to the north and northeast, and the Chinle outcrop provides some protection from southwest-erly winds.

Artifact density is greater at site GR-6 than at any other site found during the survey. Lithic debris consisted largely of basalt flakes, and a few basalt cores and chopping tools were noted. Other raw materials represented by a smaller number of flakes and cores were local cherts and silicified wood, and one hammerstone was observed. Ceramics were present in quantity, with sherds dominated by the Cieneguilla Glaze-on-yellow type, evidencing both the classic Cieneguilla, or "Glaze A," rim and the thickened "Largo," or "Glaze B," form. A few sherds of both Aqua Fria Glaze-on-red and San Clemente Glaze-polychrome were also present. Once again, as with site GR-3, no culinary pottery was recorded.

The higher frequency of the Cieneguilla type at site GR-6 suggests the possibility of a later Pueblo IV position for this

site than that projected for site GR-3, at which the GR-6 quantitative relationship of Cieneguilla and Aqua Fria is essentially reversed. While site GR-6 exhibited no identifiable dwellings, the composition of its artifact inventory is similar to that of site GR-3, as are its location and exposure. These attributes tentatively suggest similar site functions at slightly different points in time.

SITE GR-7

GR-7 is located on the east side of the deep, 3,000-foot-long arroyo that drains much of the uplands forming the south end of the survey area. The site occupies the first major point north of the arroyo's head, where a smaller arroyo cuts northwest into the former. The elevation is approximately 5,540 feet and the cover juniper-grassland. The primary view from the site is to the northeast, down the deep arroyo, which offers easy access to the Galisteo. The higher land to the east provides some protection, but the site may be considered generally exposed in all directions.

The site area was defined as about 10 meters long northeast-southwest and 3 to 4 meters wide, but it actually consists of two seemingly separate concentrations of artifacts. The larger of these is located at the southwest end of the larger area outlined above and measures about 4 meters in diameter. It is made up of scattered olla sherds, primarily of the Aqua Fria Glaze-on-red type (one Cieneguilla or San Clemente sherd was also noted here, and an Aqua Fria sherd was found about 30

meters to the south of this concentration--as with the others, these are olla sherds) and a few basalt tools, one of which is a cobble chopper with bifacial cutting edge. The artifact cluster at the northeast end of the area measures about 1.5 meters in diameter and consists of red chert flakes.

The only materials that can be surely placed chronologically are the sherds of Pueblo IV date. The basalt items were separated from the sherd cluster by enough distance to suggest the possibility of a seperate manifestation.

SITE GR-8

This site is located on a headland point directly overlooking the Galisteo from the south and its confluence with the arroyo bordering site GR-4 on the latter's west. The elevation is about 5,500 feet and the vegetative cover juniper-grassland. The site location corresponds to that of Corps of Engineers marker R-1C-1. The site locus, as based upon the concentrated occurrence of artifacts, measures about 10 meters in diameter, although items were found scattered for a distance of about 25 meters to the south, upslope, and down the face of the point to its junction with the lower 5,480-foot terrace. Exposure is general.

One Aqua Fria Glaze-on-red bowl sherd was noted within the primary site area, and others of that type as well as Cieneguilla Glaze-on-yellow were found scattered down the slope to the north. Both thickened and unthickened lips were noted

on the vessels present. The most abundant artifacts were of the lithic class, consisting of basalt, obsidian, and red, gray, and yellow chert flakes. One white chert discoidal biface was observed, as well as a pick/hoe of slate.

All of the ceramics from site GR-8 are representative of early Pueblo IV times, and the white chert biface is reminiscent of one of the chopper forms described by Alexander (1971a) from the Wheeler Site. Although Honea (1971) notes the presence of picks at La Bolsa, pick/hoe tools are most commonly associated with Pueblo manifestations.

SITE GR-9

Site GR-9 is located up a northeastward-draining feeder arroyo that enters the large arroyo from the west downstream of site GR-6, in an area of sparse grassland cover at the base of a Chinle sandstone ridge. The site lies on the north side of this ridge, but within a "bowl" formed by it and adjacent highlands, which offer general protection from strong winds. The elevation is about 5,520 feet.

The site area measures about 9 meters in diameter as defined by scattered olla sherds representing the Kiua Polychrome type (Harlow 1967:12), of a variety made at Santo Domingo and Cochiti pueblos between about 1780 and 1800. More than one vessel is present, suggesting repeated visits to the site, probably by Santo Domingos. The site lies only about 67.5 meters east of the present eastern boundary of the Santo Domingo reservation. No evidence of hearths or structures was present.

SITE GR-10

Site GR-10 represents the generalized locus of a group of widely scattered artifacts encountered at the extreme northern tip of the 5,500-foot terrace on which site GR-6 is located. Here the grassy terrace drops away to the outwash fan of the large arroyo just above its confluence with the Galisteo. The site locus measures about 18.0 by 4.5 meters, with its long axis following that of a northward-oriented, eroded terrace finger. Here a scattering of Aqua Fria Glaze-on-red bowl sherds and basalt flakes was found. To the west, northeast, and southwest about 60 meters were found sherds representing two Aqua Fria ollas, one Cieneguilla Glaze-on-yellow olla, and an obsidian flake (see locations F and K on Map 3). All of this material is assignable to the early Pueblo IV period.

SITE GR-11

Site GR-11 is located on the north side of an Entrada sandstone remnant that forms a point of the 5,500-foot contour on the west side of the same arroyo on which site GR-7 is located. The site is within the grassland of the 5,480-foot terrace directly above the floodplain of Galisteo Creek. It extends northeast-southwest along the edge of the sandstone outcrop for a distance of about 18 meters, and measures between 6.0 and 7.5 meters in width. The site may have a greater northwest-southeast extent than can be determined from surface indicators, as the terrace in this area has received some obvious soil deposition from the higher terraces to the south since site occupation.

Both ceramics and lithic debris are relatively abundant. Most of the latter consists of basalt flakes, core chunks, cores, and chopperlike tools, although some red, gray, and white cherts were observed. As with site GR-8, a pick/hoe was present at site GR-11. In the pottery, sherds of Aqua Fria Glaze-on-red predominate, although a few sherds of Cieneguilla and San Clemente, as well as Wiyo Black-on-white, were noted. Both bowl and jar sherds seemed to be present in nearly the same amounts. No hearths were recorded, and as with the similar site GR-6, no preserved structures were present. Most of the GR-11 artifacts, at least, appear to be of approximately the same date as those noted at site GR-6, and fall within early Pueblo IV times.

#### SITE GR-12

Site GR-12 is located directly opposite site GR-11 to the southeast and across the arroyo. Its position is also very similar, being at a point of the 5,500-foot contour where rock of the Todilto (?) shale outcrops. Like site GR-11 (and sites GR-3 and GR-6, as well as several others), site GR-12 is primarily north exposed. Distance from the site to the floodplain of Galisteo Creek is only about 75 meters.

The primary feature of site GR-12 is a boulder-and-cobble ring (Figure 2), which probably formed the base for a circular room. The ring incorporates the exposed shale deposit on its west side. As far as it may presently be defined, the interior diameter of this structure is 2.2 to 2.5 meters. The ring is best preserved on its uphill, southeast side, where the largest

Cobbles and boulders have been used in construction. Below the shale ledge that forms the lower western perimeter of the feature is a rectangular outline formed of slabs and cobbles, which may represent a small, associated storage structure. The interior dimensions of this feature are 48 cm. east-west and 36 cm. north-south. The rectangle appears to be open on its west end.

Artifacts were not abundant. While most of these were concentrated within the area of the ring, a few were found scattered for a distance of about 2 meters to the north over the immediately adjacent terrace. Pottery sherds for the most part represented Aqua Fria Glaze-on-red ollas, although a few specimens of Cieneguilla Glaze-on-yellow, and perhaps, San Clemente Glaze-polychrome, were present. Most of the lithic debris consisted of basalt flakes, and only a few flakes of pink chert and white quartzite were noted. One cobble cutting or chopping tool was present. Site GR-12 appears to represent a rather briefly used farmstead of the early Pueblo IV period.

#### SITE GR-13

Site GR-13 occupies a headland point of the 5,500-foot contour directly east of and across the arroyo from the very similar site GR-8. The site is located about 75 meters south of the Galisteo floodplain and overlooks a narrow band of the 5,480-foot terrace. The site commands an excellent view of the valley and in turn can be readily seen from it. Exposure is general in all directions but the south, the bluffs rising

rather steeply to the 5,520-foot contour here. Cover is juniper-grassland.

Artifacts are thinly scattered for a distance of about 45 meters north-south along the ridge line, and 30 meters east-west over its lateral slopes. Sherds of both Aqua Fria Glaze-on-red and Cieneguilla Glaze-on-yellow were present. Once again, basalt flake tools were common, and one pick/hoe of basalt was noted. Also present were flakes of red and white chert, one worked into a scraper. The site is almost identical to site GR-8, and assignable in the main, if not wholly, to Pueblo IV times.

SITE GR-14

Site GR-14 is located at the same general elevation as site GR-13, up a short feeder arroyo to the latter's southeast. The site is almost exclusively north exposed, lying at the base of an extensive Morrison sandstone ledge that backs it to the south, and enclosed on the west and east by higher bluffs. Material was concentrated for a distance of 18 meters east-west and 6 meters north-south along the base of the sandstone outcrop. Sherds of Aqua Fria and Cieneguilla appear to be equally common, and a few sherds of San Clemente Glaze-poly-chrome were noted. Lithic material appeared to consist exclusively of basalt flakes, cores, and one possible bifacially flaked chopper. About 50 meters down the ridge to the north was found a concentration of obsidian flakes, and between these

points, a few flakes of basalt were observed. It is entirely possible that the obsidian debitage does not relate to site GR-14's occupation, which may be placed in the early Pueblo IV period.

SITE GR-15

Site GR-15 lies on the arroyo directly east of site GR-14 in an area of grassland cover on the 5,480-foot terrace and about 60 meters south of the Galisteo Creek floodplain. The site occupies an area about 2 meters in diameter as defined by the scattered sherds of a single Kuia Polychrome bowl. The specimen generally agrees with Kuia variations assigned to the period 1800-1920, but I suspect that it falls within the earlier half of that range.

SITE GR-16

This is one of the few sites found north of the large arroyo. It occupies a bluff headland of the 5,500-foot contour overlooking the broad terraces and floodplain of Galisteo Creek from the southwest. The site area is occupied by grasslands exhibiting extensive colonies of yucca. Although somewhat sheltered to the south, it may be considered generally exposed.

The site area possesses a diameter of about 15 meters around and in a dense yucca stand. Artifacts consisted exclusively of basalt items. Flakes, while present, were not common, and most of the tools were large unifacially and bifacially flaked choppers and cores (or core tools). The choppers

found at site GR-16 appear to be most similar to those described by Honea (1971) from the Bajada Phase Archaic site of La Bolsa, and this site has been tentatively assigned to that cultural complex. The nature of the GR-16 artifacts suggests that the site functioned as a special activity area for some group maintaining a base camp elsewhere, perhaps at La Bolsa itself. The kinds of tools found at site GR-16 might well have been best adapted to the processing of cacti and yucca parts (Irwin-Williams 1973:7), which suggests a very possible function for this site.

SITE GR-17

Site GR-17 is located in an eroded grassland area of the 5,480-foot terrace on the north margin of the large arroyo. It consists of a concentration of chert, basalt, and limestone flakes covering an area only about 2 meters in diameter. The cherts were highly varied, i.e., moss agate, red, orange, and white. Associated with this flake cluster was a sherd from a flat-based Tewa polished red jar. Such pottery appears by at least midseventeenth century and was present at the Rebellion period Signal Site (Alexander 1971; Harlow 1973:80). Polished redware is still made today in some of the Tewa pueblos. If the sherd and flakes are historically associated, as they are physically, then a date prior to the 1860s seems likely for the GR-17 occupation.

SITE GR-18

This site is the only one recorded that lies outside the

contracted survey area and Corps of Engineers land, in an area that is apparently part of a private holding. Site GR-18 was the only site encountered on the north side of Galisteo Creek, possibly due to the great degree of recent land disturbance there. It lies on a high bench point at 5,560 feet of elevation, which offers a tremendous panoramic view of the valley and the uplands to the south. Cliffs of the Morrison Formation drop away from the site to the south and northwest and rise above it to the east. The only reasonable approach to the site is from the north. Site cover consists of juniper-grassland, with numerous flowering annuals.

The site covers an area about 20 meters in diameter. Artifacts consist of red and mottled-gray chert flakes, tools, and core fragments, obsidian flakes, and basalt flakes and hammerstones (three noted). No hearths or structures were present. The only activity suggested by these materials is the production of flakes and chipped-stone tools. The fact that the raw materials represented could not have been obtained in the immediate site area and had to be transported to it, however, suggests that the site's workshop aspect may have been secondary to other kinds of functions not readily determinable.

#### SITE GR-19

Site GR-19 is located near the center of a long headland ridge of the 5,540-foot contour, at the end of which lies site GR-11. Although the site is generally exposed, it can be viewed at a distance only from the east and south. Site cover is juniper-grassland.

Material found here consisted of several basalt flakes and numerous white chert pressure flakes scattered over an area about 3 meters in diameter.

ISOLATED ARTIFACTS

The distribution of isolated artifacts within the survey area is illustrated on Map 3. The general areas in which these occurred were given letter designations, and those not previously treated in the text of this report (F and K) are discussed below.

Area A. This is an area of stabilized, juniper-grassland covered dunes that extend northeastward from about 5,580 to 5,540 feet of elevation along the east-central edge of the survey area. Several chert flakes were found in this dune area (marked by triangles), but no concentrations were present.

Area B. Located along the arroyo margin (east side) northeast of site GR-7. A single core of mottled gray chert and two decortation flakes were found here.

Area C. Northeast of area B. Artifacts consisted of a small basalt biface and a basalt flake.

Area D. North of the extreme northern end of area A at 5,520 feet. A single red chert flake was noted here.

Area E. Located southwest of site GR-8 and west of and directly across the arroyo from site GR-4. A few chert flakes and one flake knife were found scattered over a wide area of the

feeder arroyo's western margin here.

Area F. See the description of site GR-10.

Area G. Located in an eroded area of Chinle-derived red soils near site GR-9. Two basalt cores, one large unifacially flaked chopper like those noted at site GR-16, a white chert flake knife, and one gray chert plano-convex end-scraper were found in this area.

Area H. Located on a headland of the 5,500-foot contour and at the base of its north end. Three chert flakes were found on this bluff area, and an equal number noted around its base at the 5,490-foot terrace level.

Area I. Located on points of the 5,500-foot bluff. Three flakes--obsidian, basalt, and chert were found here.

Area J. Located on a bluff point of the 5,490-foot contour. A single large, unifacial basalt cobble chopper, probably of the Bajada Phase, was present.

Area K. See the description of site GR-10.

### 5. DISCUSSION OF SITES

Significant sites recorded during the survey cluster within four basic groups:

1. those producing basalt cobble tools characteristic of the Archaic Bajada Phase
2. sites exhibiting extensive chert knapping debris and occasional tools but no culturally or chronologically diagnostic artifacts
3. those producing pottery representative of early Pueblo IV or "Classic" Rio Grande Pueblo times in addition to lithic artifacts; two evidencing dwellings of masonry construction
4. sites of the historic period that exhibited Keresan and Tewa pottery of the period from about A.D. 1650 to A.D. 1920.

The negative aspects of the above chronological outline are certainly as interesting as its positive content. No very early, pre-4800 B.C. Archaic sites that could be identified as such were present, and still earlier ones of Paleo-Indian cultures are definitely lacking. Likewise, no sites were found that could be assigned to the long period between about 3200 B.C. and A.D. 1380, representing later Archaic developments and Puebloan groups of the period after A.D. 600. In general, these observations parallel those that came out of the Galisteo Dam project of the 1960s, although one Santa Fe component village was found and excavated during that study. It is also of interest that a shorter gap, between about A.D. 1440 and A.D. 1650 or later, spanning all of the later "Classic Period," is indicated, although large pueblos located to the east and west of the survey area and at no greater distance than

about 3 to 8 miles away, were occupied during this time interval. At this point in our growing understanding of northern Rio Grande prehistory, it is often difficult to expound at length, or confidently, on the conditions that have dictated the presence or absence of sites belonging to a given period of time and cultural development, and this condition is particularly remarkable with regard to the Galisteo Basin. However, a few speculations along such lines will appear in the following sections.

#### LITHIC SITES

Quite simply put, this term is applicable to all sites encountered that did not produce pottery, independent of their potential affiliation with time intervals during which ceramics were in use. Sites of groups 1 and 2 may be treated collectively under this heading, in addition to those that produced isolated lithic artifacts and negative classes of preceramic sites.

The absence of Paleo-Indian sites in this rugged upland region of the Galisteo Basin is not surprising, as most such stations found in the northern Rio Grande have been within areas of great, open grassland plains (W. James Judge, pers. com.), which is suggestive of an adaptation generally corresponding to that documented more clearly in other areas of the West, i.e., the hunting of bison and other megafauna. As previously noted, no actual Paleo-Indian "sites" have been reported for portions of the region much north of Bernalillo in the Rio Grande Valley and its tributaries, although Peckham (pers. com.) has told me of at least two known finds of Clovis points in the general area of Santa Fe and I have found an isolated Eden-Scottsbluff point

lower midsection in the open juniper-grassland of the Arroyo de los Frijoles area, a few miles north of the Santa Fe River. Such finds seem to indicate occasional excursions into environments and geographic areas basically atypical to these early hunting cultures. If the remains of Paleo-Indian activities are present in the western Galisteo Basin, they are most likely to be found well west of the survey area in the grasslands near Santo Domingo and northward between that community and the escarpment of La Bajada. While Judge (pers. com.) has inspected portions of that area with a specific interest in the occurrence of Paleo-Indian sites, no systematic surveys have been conducted there.

In the Arroyo Cuervo region, early Archaic J-Complex sites of the period 5500 to 4800 B.C. (Irwin-Williams 1973:5-6) are less numerous than those of the succeeding Bajada Phase, and the location of such sites in the Galisteo Basin may be simply a matter of time and effort, as they appear to have a very wide distribution elsewhere. (On the contrary, of course, they could be absent.) Although the short, stemmed points found in late Bajada contexts in the Arroyo Cuervo studies (Irwin-Williams 1973:Fig. 7) do not seem to be present at La Bolsa, the large numbers of cobble choppers recovered from that site may suggest a relative lateness within the internal Bajada sequence, i.e., about 4000 to 3200 B.C., as is also the case with the hearth types found. If the metates and manos from La Bolsa are associated with the Bajada component and not some later Archaic manifestation, they would require consideration as a third

trait indicating lateness. Thus far, La Bolsa is the only Bajada Phase base camp found in the basin.

As previously noted, site GR-16 has been tentatively assigned to the Bajada Phase as a chopper type characteristic of the La Bolsa site inventory and not noted at later sites is present there. In addition, I would identify the isolated chopper finds of areas G and J with this phase for like reasons. Although basalt tools were common at several other sites of the survey area, they appeared to be either nondiagnostic or of a sort more properly relatable to much later cultural developments. The distribution of probable Bajada sites in the area is of interest, as they are restricted to the northwestern quarter of the survey area, while the density of sites belonging to other time periods is greatest in the area's south end. Although the significance of the following correlations is open to question, the juniper-grassland and grassland-covered bluffs and ridges along which these sites are distributed are much drier than those to the south of the large arroyo, being more south exposed, and in two cases the associated drainage lines are relatively shorter than those to the south, resulting in less well developed floodplains and low terraces. As will be discussed later, these differences may relate to the concentrated occurrence of Pueblo IV sites and the nonagricultural status of Bajada Phase culture but do not imply some clarifying explanation of cobble chopper site distribution.

Site GR-16 and the G-J localities all seem to represent plant food collection and processing stations that saw varied

intensities of use by a population affiliated with a base camp located outside the survey area or in some portion of it now destroyed. If a base of operations similar in context to that of La Bolsa obtains, then the former is the most likely case. It is probable that the plants being exploited were cacti and perhaps yucca, which is common on the northern ridge tops today, as the large choppers would prove quite serviceable in their procurement and preparation. We may assume that the highlands of the survey area's northwest quarter were even drier during the Bajada Phase than at present (Schoenwetter 1971) and that the area as a whole was dominated by grasslands above the 5,480-foot contour.

Post-Bajada developments of the Archaic may be represented by the non-Bajada obsidian points from La Bolsa and possibly the milling tools from that site. Both "expanding straight-edged" stemmed points (Honea 1971) and crude milling tools are common to the San Jose Phase (about 3200 to 1800 B.C.) in the Arroyo Cuervo region (Irwin-Williams 1973:7-9, Figs. 4, 7). In addition, Alexander (1971) illustrates points found at the Wheeler Site, which are believed to have been picked up or otherwise obtained by Wheeler's Pueblo IV occupants from Basketmaker sites, which could date anywhere between the last few hundred years of the pre-Christian era upward to about A.D. 600. There is no assurance, however, that these points originated in the basin. As sites GR-4 and GR-18 exhibited an abundance of artifacts but no pottery, they form potential candidates for the representation of some post-Bajada Archaic manifestation,

but as no diagnostic artifacts were noted, possible Puebloan ties cannot be completely ruled out. These sites share with site GR-16 a lack of hearths, but differ both in the preference for chert over basalt seen at sites GR-4 and GR-18 and extensive evidence for onsite knapping activites. Other sites producing only lithic debris, such as GR-19, are not placeable chronologically on the basis of the survey data alone.

#### PUEBLO IV SITES

Sites producing pottery assignable to the Pueblo IV period make up about 53 percent of the designated survey area sites and over 83 percent of those exhibiting enough refuse to suggest relatively long-term, although periodic, use. This increased density over earlier times clearly correlates with the initial appearance of relatively large Puebloan villages and towns in the western Galisteo Basin, population then expanding to proportions that seem to be unprecedented for the area. On the basis of their ceramic content, the Pueblo IV sites recorded may be roughly placed between about A.D. 1380 and A.D. 1440, a span correlating with the initial occupations (as far as they are documented) of Santo Domingo and Gipuy, the occupation of the Wheeler Site, and the terminal years of San Marcos's Roomblock XXXVIII.

While the Santa Fe component Waldo Site is located quite close to the survey area and Galisteo Black-on-white sites are rather common east of Carrillos, no evidence for the activities of associated cultural groups or for earlier Puebloan use of the

survey area was found. This condition begs for explanation but would require a more detailed scrutiny of the problem (and perhaps data not yet available) than is possible here.

Of the ten Pueblo IV sites located (GR-3, GR-5, GR-6, GR-7, GR-8, GR-10, GR-11, GR-12, GR-13, and GR-14), four are located along the 5,480- to 5,500-foot terraces directly overlooking the Galisteo or the large arroyo and six on the upland ridges above 5,500 feet or on eminences of that elevation (GR-8, GR-13, and GR-14 fall within the latter category). All are in the southern area of moister soils, long feeder drainage lines, and correspondingly extensive floodplains and low sandy terraces. Of the sites having extensive middens and/or masonry structures, all are located on the north sides of rock outcroppings and primarily north exposed. Within this group, only the location of site GR-3 could possibly be classed as concealed.

Collectively, data relating to the more extensive Pueblo IV sites suggest use as farmsteads, and the presence of pick/hoes at some of the less intensively used locales is also suggestive of some functional relationship to agricultural activities. The north-exposed, south-protected locations of the more important sites would seem to indicate warm-weather occupation in the main, in addition to the periodicity of such occupations implied by a comparative thinness of middens and either a lack of preserved structures or the presence of rudely constructed ones. Occupation during the summer season would also agree with the apparent absence of hearths at all sites. Such absence may also have implications for recognizing a limited

range of activities, as does an absence of milling tools.

Within the Pueblo IV sites, the relative frequencies of the types Aqua Fria Glaze-on-red and Cieneguilla Glaze-on-yellow, as well as patterns of rim form change, may offer an avenue for the segregation of these sites in time. Referring now only to sites GR-3, GR-6, GR-11, GR-12, and GR-14, for example, Aqua Fria appears to be dominant at GR-3, GR-11, and GR-12; Aqua Fria and Cieneguilla equally well represented at GR-14; and Cieneguilla dominant at GR-6.

After about A.D. 1440, a hiatus of 200 or more years in site presence occurs in the survey area. This event suggests that other factors beyond demographic ones are influencing site occurrence and site density, as the closest major pueblo, that of Gipuy, was occupied up to the 1580s, at which time it housed an extensive population. The abandonment of sites such as Wheeler can without much doubt be partially attributed to the draught of about A.D. 1425, and it is also possible that the discontinued use of some of the small survey area sites is also related to this event and its greater repercussions. However, the complete and permanent abandonment of the survey area as a locus for the farming activities of some groups may fit within a broader picture defined by Mara (1940:6-12, 15-21), who noted an overall decline in the number of "small" early Glaze sites over much of the northern Rio Grande after the end of the earth fifteenth century. In general, the meaning of this decline is not perfectly understood, but it seems to be associated with the

concentration of population in large settlements along perennial streams where a combination of increased available energy and dependable water resources allowed large-scale irrigation of croplands and enhanced dependability of yields. It may be that the end of farmstead efforts in the survey area directly relates to larger happenings of the sort outlined, which is precisely what might be expected if a shift from a rather diffuse agricultural adaptation to a highly focal one occurred between about A.D. 1425 and A.D. 1450.

HISTORIC SITES

At least two of the historic sites found during the survey can be most logically related to the activities of people from Santo Domingo Pueblo sometime between about 1780 and 1920. Although site GR-1 produced Puname area, rather than Santo Domingo-Cochiti area, pottery, it falls within the same range. The status, either temporally or culturally, of site GR-17 cannot at present be determined, but it could be the earliest site of the four.

#### 6. RECOMMENDATIONS FOR CLEARANCE

If the 430.38 acres constituting the survey area are to be disposed of by the Corps of Engineers, the following treatment of the archaeological sites described previously is recommended.

1. Collection of surface materials at sites GR-1, GR-2, GR-4, GR-5, GR-7 GR-8, GR-9, GR-10, GR-13, GR-15, GR-16, GR-17, and GR-19. Artifacts are so thinly scattered at all of these sites that even in those cases where some artifact diversity is indicated, controlled collection could not be expected to yield quantitatively significant data. Consequently, gridding of these sites prior to collection does not appear warranted.

2. Collection of surface materials only is also recommended in the case of site GR-14, but as density is fairly great here, gridding of the site prior to collection is suggested as an aid in maintaining spatial control.

3. A combination of gridded surface collection and excavation is recommended in the case of sites GR-3, GR-6, GR-11, and GR-12, which have potential for contributing significantly to our understanding of seasonal Puebloan activities in the western Galisteo Basin during early Pueblo IV times. As each site possesses particular qualities not shared with the others, excavation sampling procedures differ accordingly:

Site GR-3

Excavation of the masonry structure and an area 1 meter wide along its exterior wall margin, and a trench 1 by 10 meters to the north of the north wall.

- Site GR-6      Excavation of a gridded rectangle tentatively projected as 3.5 meters wide and 2.0 meters long covering the most productive area of the site.
- Site GR-11      Excavation of a gridded rectangle tentatively projected as 5 by 15 meters in size positioned over the most productive area of the site.
- Site GR-12      Excavation of the masonry structure or structures and of a 1-meter-wide trench extending north of the main circular structure for a distance of 3 meters.

Analysis of recovered materials will focus upon questions of:

- (1) intersite chronology; (2) site function; (3) sources of seasonal population; (4) the isolation of multicomponent elements, if present; and (5) the definition of area use through time.

The following outlines projected time, manpower, and cost expenditures required for the collection, excavation, and analysis of archaeological sites in the survey area.

#### TIME/MANPOWER ESTIMATE

- Field:
1. General collection of surface materials, 13 sites (4 field days; 12 man days).
  2. Gridded collection of surface materials, sites GR-3, GR-6, GR-11, GR-12, GR-14 (2.5 field days; 7.5 man days).
  3. Excavation, sites GR-3, GR-6, GR-11, and GR-12 (8 field days; 24 man days).

#### Laboratory:

1. Processing and cataloging of artifacts (10 man days).
2. Analysis of lithic attributes (20 man days).
3. Analysis of other artifacts and writeup (30 man days).

COST ESTIMATE

Principal Investigator	\$ 200.00
Administrator	480.00
Project Director: Field--\$ 870 Office-- 1,800	2,670.00
Crew Members	812.00
Project Secretary	224.00
Analysis Assistance	<u>1,080.00</u>
TOTAL WAGES	\$5,466.00
Overhead (33%)	1,803.78
Social Security (5.85%)	319.76
Workmen's Compensation: Field--\$58.63 Office-- 8.31	66.94
Mileage	200.00
Per Diem	870.00
Equipment and Supplies	300.00
Publication: Manuscript preparation, editing, copying	150.00
Project Preparation: Logistics, etc.	60.00
Building Upkeep and Physical Plant Maintenance	<u>120.00</u>
TOTAL COSTS	\$9,355.48

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**APPENDIX**



SWAED-EP

DEPARTMENT OF THE ARMY  
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS  
P. O. BOX 1580  
ALBUQUERQUE, NEW MEXICO 87103

10 December 1975

Dr. Douglas W. Schwartz  
Director  
School of American Research  
P.O. Box 2188  
Santa Fe, New Mexico 87501

Dear Dr. Schwartz:

The Albuquerque District, Corps of Engineers, plans to dispose of 430.38 acres of land at Galisteo Dam, New Mexico. This land is not required for project operation and has been determined excess to our needs. Prior to sale of the land, this District must prepare an environmental assessment on the impact of disposal and must have an archeological survey of the area completed.

Inclosed is a map indicating in red the area to be excessed. Please provide us with an estimate of the cost of an archeological survey of this area.

If you have any questions, please contact Mr. David Clawson at 766-2657.

Sincerely yours,

JASPER H. COOMBES, P.E.  
Chief, Engineering Division

1 Incl  
Map



mmended to be excessed

be retained for project

served to the Govt

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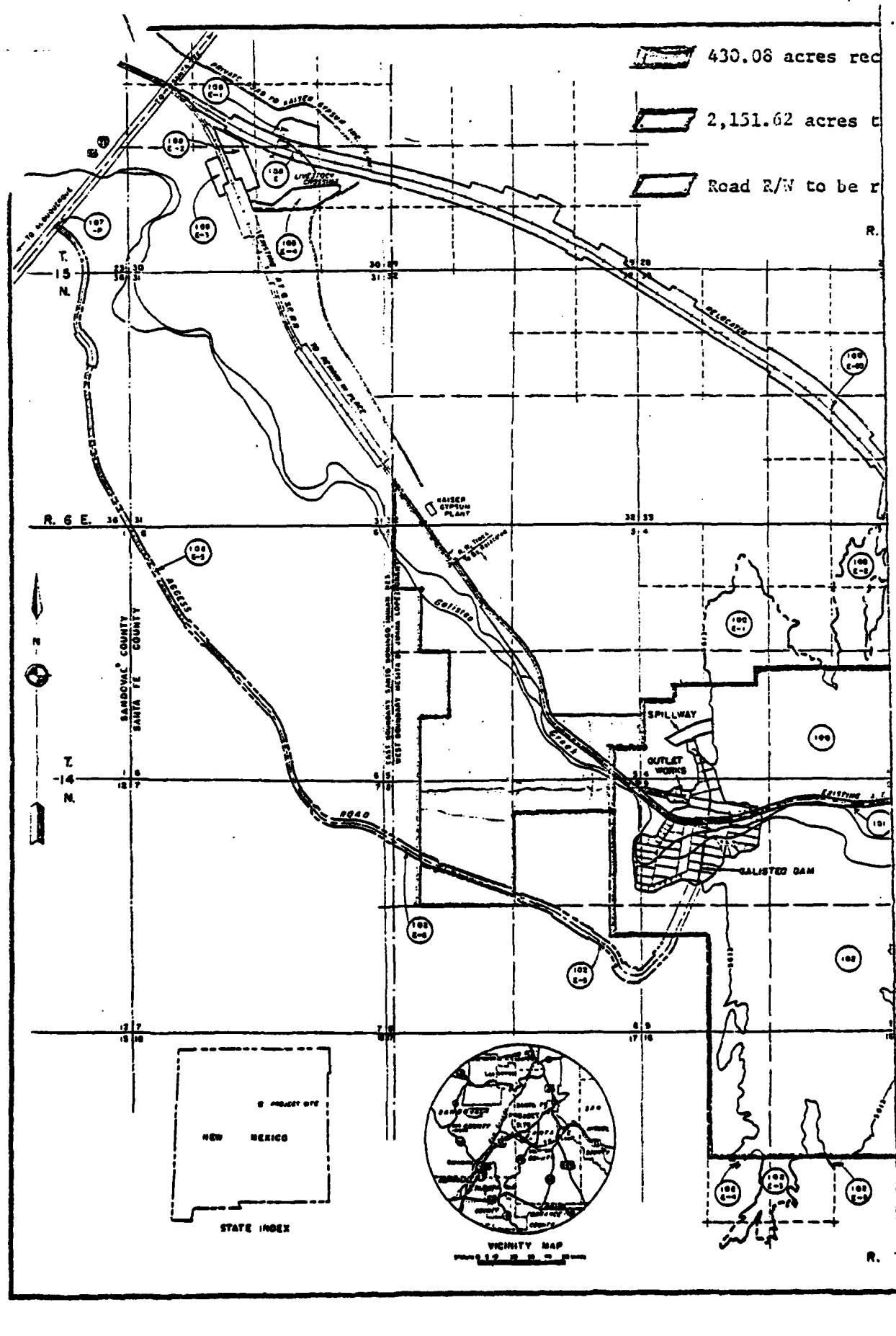
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